STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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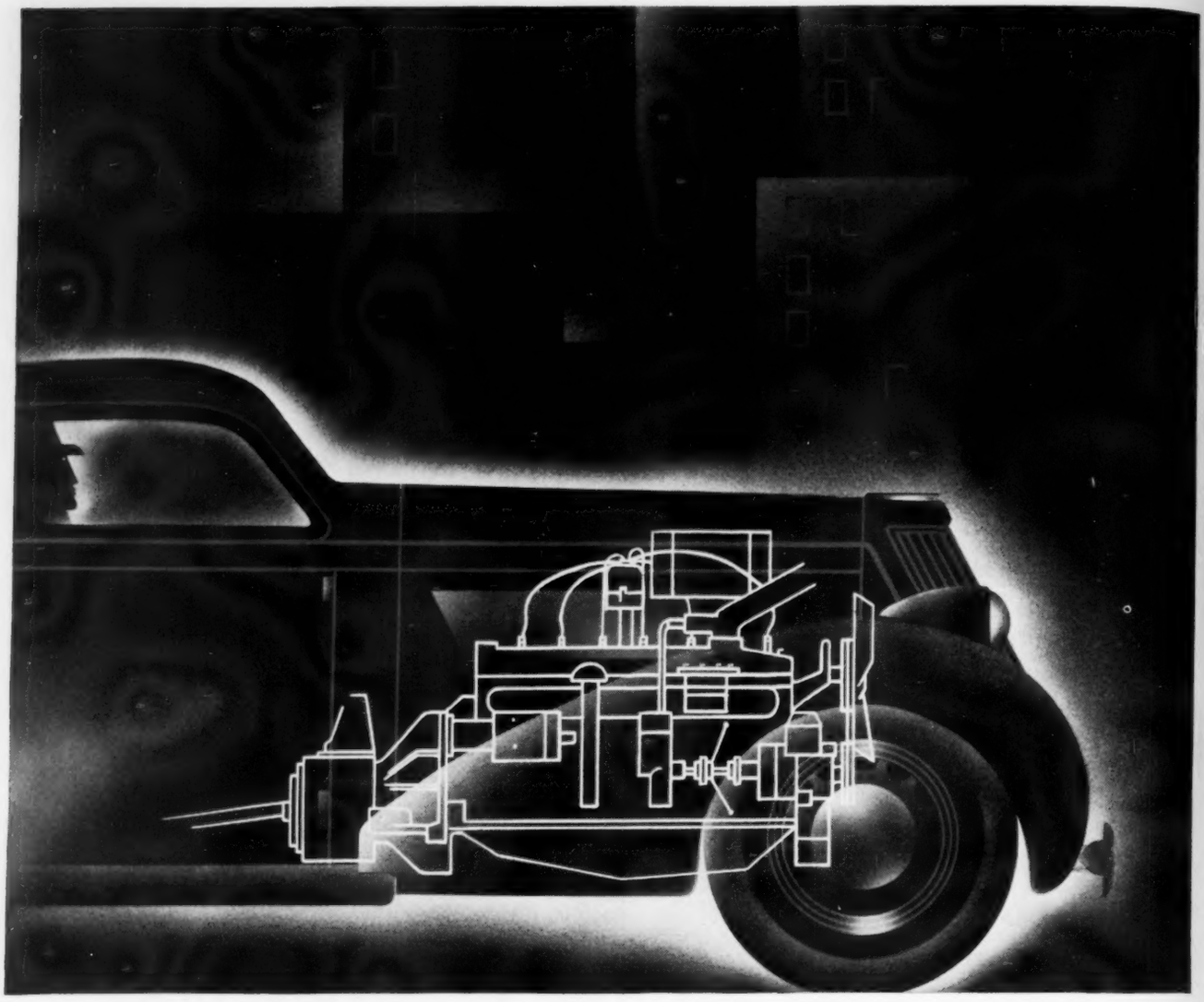

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As the Editor Views the News

HAVING experienced four consecutive months of sustained activity at high levels, executives in the iron, steel and metalworking industries now should realize that any further appreciable increase in demand will tax some of our present facilities severely. Until now the increasing business attending recovery has been handled more or less comfortably with plant and equipment which existed in the predepression period. Very little expansion has taken place to date and only a small fraction of the obsolete facilities has been modernized. More men have been employed and more hours are being worked, yet the supply of workers still is abundant except in certain skilled trades.

• • •

Facilities Will Be Inadequate

Because the present volume of business has been handled with apparent ease, there is danger that we will underestimate the extent to which a further march toward recovery will tax existing plant, equipment and personnel. Even today, industry is facing a strong probability that its rehabilitation of plant and equipment to date will prove inadequate to accommodate the work that will come its way in the early future. Before long we will need much more modernization, considerable construction of new facilities and a much larger army of trained skilled workers. In short, we have much to do before we will be prepared for real prosperity.

• • •

Be Prepared for Prosperity

To those who are inclined to belittle the seriousness of this problem, the experience of England should be enlightening. That country is further along on the road of recovery than the United States. Today it faces problems we will be meeting a year or more hence. The lesson its experience teaches (pp. 19, 31) is to rehabilitate and extend plants and equipment and to train men for future frenzied activity. To appreciate the wisdom of this course, it is only necessary to look into the condition of facilities at home. Take blast furnaces, for instance. Of the 106 stacks now idle in the United States (p. 16) only 20 could be placed in blast within two weeks or a month. The job of reconditioning blast furnaces involves a repair bill of $25,000,000. We are even more remiss in training personnel. We face a real job of preparedness!

• • •

Interested in Job, Not Union

Steel company employes are reluctant to talk to outsiders or strangers about labor relations. A person seeking to learn their attitude on the unionization drive of CIO must first win their confidence before they will talk freely to him. STEEL is fortunate in having an associate editor who, having once worked in the mills and knowing the lingo of the mills thoroughly, is able to fathom the minds of employes. From a visit to the valley (p. 14) he has gained the definite impression that the men in steel are more deeply interested in good jobs at good wages than in the prospect of joining a union. Here is a colorful story, well worth the reading.

• • •

More Uses for Steel

Interesting applications of steel are reflected in numerous articles in this issue. Alloy steel plates (p. 34) are used in truck frames, bolsters, etc. of subway cars. An Ohio manufacturer is making Venetian blinds (p. 37) from 32-gage, prefinished, lacquered steel. A Pittsburgh hospital is storing supplies in steel cabinets (p. 44), in which the ledges and workshelves are of stainless steel. By specifying box car doors of low-alloy, high-tensile steel (p. 45) an Ohio manufacturer effects for its customer a saving of 300 pounds per car. A flywheel for a reversing mill (p. 54) has been fabricated from welded steel plates. This built-up unit is 180 inches in diameter and weighs 70 tons. A combination of low-alloy, high-tensil esteel and aluminum reduces dead weight (p. 57) in a coal unloading bucket.

E. L. Shaner

"THE BRIDGE" AT YOUNGSTOWN SHEET & TUBE CO.'S CAMPBELL WORKS: More workmen are crossing this bridge today than at any time in the past five and a half years. What do they think of outsiders' organization plans for them, when work is increasing, and wage rates are highest in history?

Valley Steelworkers Cold To CIO Plans; Want Jobs More Than Unionism

John D. Knox

STEEL sent John D. Knox, associate editor, and formerly a practical steelman, into the Youngstown, O., district to learn the true sentiment among steel plant workers toward the CIO's trade union drive. From having worked with them many years, Mr. Knox knows the men, many of them by their first names, understands them—"speaks their language." Do the majority want to be organized? Is there any real strength behind the CIO campaign, so far as the workers themselves are concerned? Mr. Knox's answers to these questions are reported in the following article.

LAST week I spent a couple of days in the Mahoning valley circling the many steel plants in Warren, Niles, McDonald, Brier Hill, Youngstown, Campbell and Struthers, questioning many workmen off duty, observing their countenances, and listening to their conversation in an effort to learn what these men think of their working conditions.

Do they want to be organized—by the CIO, for example—as a means of obtaining higher wages, shorter hours and a better standard of living? Or, are they satisfied with the present set-up?

What is to be learned from the attitude of these men? Only one thing—a steel strike in the near future, or even next spring, as far as this district is concerned, is highly improbable. These men want to be left alone. They have jobs. Work is steady. Pay envelopes bring cheer, not only to the men who have earned them, but to the silent partners at home who pack the dinner pails.

From one end of the valley to the other hardly a stack is to be seen that is not belching out smoke. Dirty? Sure it's dirty, but you don't hear complaints.

A few months ago these stacks stood as silent sentinels overlooking the rusty roofs of mill buildings. Today mill whistles are announcing the noon hour, and the change of turns.

Today, there is life in the valley steel plants.

Ore Piles Disappearing

There is a hum of gears as the operator lowers his bucket from an ore bridge, takes a "bite" from what was a good sized ore pile two years ago, and swings the load over to the transfer car spotted on a nearby trestle. Today ore buckets are scraping bottom. Orders received at the city offices are calling for more iron.

Blast furnaces throughout the valley are blowing as they have not blown for months.

Brown fumes are being ejected from the top of stacks protruding from open-hearth buildings, and it matters not to what open-hearth plant you refer—whether it be those of Sheet & Tube's at Campbell and Brier Hill, or Republic's at Lansingville or Warren. All are emitting fumes—evidence that men on the charging floor are making steel.

What about the open-hearth stacks that are cold? Well, beneath the "dead" stacks brickmasons are working like beavers to get the furnaces ready for charging.

I saw operators of locomotive cranes drop magnets into a "sea" of scrap. It reminded one of a fisherman. Up would come the magnet with a batch of scrap clinging to its face, around would swing the boom of the crane over the line of charging boxes, and then with a clang the scrap would come to rest in the containers as the operator cut off the current. Time and time again this operation would be repeated until the train of boxes was loaded.

Then announcing its departure by a couple of short blasts from its whistle, a dinky locomotive snorted three or four times through its stubby smokestack, and finally settled down to steady puffs as it gained speed. Away rolled the drag of scrap around the curve and up over the trestle. One by one the buggies carrying the loaded boxes disappeared inside the building, and finally the locomotive.

Today there is activity in the steel mill buildings.

Short blasts from whistles, sounded by rollers stationed in blooming mill pulpits, are signaling for more ingots.

Bells on time clocks are ringing more often. More time cards are in the racks and a greater number of timekeepers are to be seen on their swivel seats bending over sloping top desks as they transfer their time record from the books used on their morning and afternoon rounds to the monthly sheet.

Listen, and you'll hear the tramp of men's feet on the ramps just in-

side the mill gates—it matters not whether you are in Youngstown, Niles or Warren. Look at the columns of sweaty men coming out of the various buildings following the blast of the turn whistle announcing that the "trick" is over for another 16 hours.

Here they come, some carrying their coats, and some without coats but with towel, once white, draped around the neck, like a scarf with which to wipe away perspiration. If there is any discontent, their faces do not betray it.

After an eight hour's trick on the end of a shiny-handled shovel, heaving dolomite toward the backwall of an open hearth, or swabbing hot ingot molds in preparation for the next heat; after a turn up against the pipe welding furnace, or a stretch on the soaking pit floor, you would think these men would have cause for complaint.

If you entertain an idea that these men are looking forward to the time when they will be seated around a hall, listening to the promises of an "organizer," dismiss it. For the faces of Mahoning valley steelmakers do not give the least inkling that they are interested in a change. Why?

Because there is activity in the steelworks.

More steel is in the rolls. Finished material is leaving shipping platforms in greater quantities, order clerks in the city offices are looking at mill schedules more closely, endeavoring to locate an attractive delivery date for an inquiring customer.

And for these reasons, and these reasons alone, steelworkers and their families have full stomachs, and it's a mighty difficult task to convince them that they should become unionized.

Talk with some of these fellows and you will find men with thankfulness in their hearts. Business men these days may be perplexed over industrial problems, but not the men to be seen wending their way homeward after a day's work in the valley mills—be they Lithuanians, Poles, Italians or Americans.

These men have jobs. They are getting their pay regularly. Instead of paying $3 union dues, they use the money for other purposes, or in their own words, "the wife gets a wash woman."

Whittlin' Their Debts

These men are paying their bills and reducing indebtedness—something not possible until a few months ago. Talk about organizing these men? Spoil their stride at a time when things are "hunky dorry," as they say? Arouse these men to a pitch where they will open their pay envelope each week and see that their union dues are on the right side of the ledger? They are not interested. They want to work and are satisfied with the present set-up.

To cite an incident—in a certain plant I mounted the steps leading from ground level to the charging floor of an open hearth which was walled in on one side with a battery of 100-ton furnaces, and open here and there on the other side for ventilation.

In front of the furnaces lay the tracks for the charging box buggies and tracks with a 20-foot spread for the charging machine. Over the steel plated floor were scattered piles of dolomite, ferromanganese, fluorspar, iron ore, stirring rods and rabbling bars.

Across the charging floor from the furnace, not far from the reversing valve and door raising levers some of the furnace crew were resting on a wooden bench carved with many initials.

Recognizing the first helper as a "slagger" on No. 12 furnace at Lackawanna back in 1911, I immediately joined the group and gossiped about old times, comparing them with present steelmaking conditions.

I inquired as to what the men on the floor thought of the attempted movement to unionize the steel industry.

But, before he could answer one of the charging doors opened, and moving his blue glasses from his forehead to the bridge of his nose he grabbed a shovel and fell in line with other members of the crew. Each man in turn scooped up a shovel full of dolomite, walked up to the charging door without breaking his stride and heaved the granular material straight as a bullet into the pits that had been gouged in the refractory bottom by the molten steel.

These men, with their blue glasses high on the nose so they could look beneath the rim as they faced the brilliant flame playing across the hearth; scooped and heaved; and with a steady gait walked back and forth from the pile of dolomite to the furnace. And when the last shovelful of bottom-making material had been fired on the hearth, the door was closed and soon after the rays from the flames coming through the peep holes danced on the sheet iron siding.

One by one the men returned to the bench with perspiration streaming down their chests. My friend and I sat on the edge of a rectangular water tank.

"Unionize the crowd of men on this floor?" he asked after mopping his brow and lighting a corn cob pipe. "Say, oldtimer, the river is quite some distance from here, but it makes no difference. I think if a man were to stop the boys at the gate, or any other place, and begin talking union to them, the minnows over in the river would start going upstream—and I don't mean maybe.

"We have a representation plan in the plant here and she's working O. K. Nobody's kicking. The company's treatin' us all right. Why say, we have some young fellows on the floor whose fathers are too old to work in the mill. These kids were given jobs when they couldn't find them anywhere else so that they could keep their old dads. What do

(*Please turn to Page* 21)

STEAM from the "dinkey" locomotives, and moving ingot molds spell work—jobs—for the steel mill hands. In the Youngstown district, where this photograph was taken, steelworks operations currently are at 79 per cent

Need $25,000,000 to Repair Furnaces, as Scrap Soars

SINCE 1918, 203 blast furnaces in the United States have been dismantled. In all that time only 20 furnaces have been built—yet the rated capacity of the 252 stacks in existence today, 49,777,893 gross tons annually, is only 100,000 tons less than that of the number standing in 1919.

Not one blast furnace has been built since 1928. Stacks have been remodeled and enlarged, but even the steel code prohibited expansion of pig iron capacity, as it did that of raw steel.

Idleness and obsolescence apparently has cut a wide swath in available blast furnace capacity. The recent rise in scrap prices—the most rapid in all peacetime history of the industry—is causing steel plant operators to consider the possibility of using more pig iron, with the result that Pittsburgh engineers estimate at least $25,000,000 will be required to put in condition for operation the many stacks which have been out of blast for long periods, and those which have been worked during the depression.

Although enlargement of blast furnaces has been a trend over the past two decades making for fewer stacks, 252 furnaces still are listed as potential producers. Of this number 146 were in blast Aug. 1 when STEEL last compiled its monthly pig iron production report, 106 being idle.

Of these idle how many can be readily placed in operation? How many need relining? How many require repairs beyond relining? How many are beyond repair and await dismantlement?

The bare statement that 106 additional blast furnaces are available would be misleading. Investigation reveals that not more than 18, possibly 20, could be placed in blast within two weeks to a month's time.

Considering 20 furnaces as potential leaves a balance of 86 stacks, all of which need repairs in varying degrees to stack linings, shells, stoves and miscellaneous equipment.

Of the 86, ten have no lining whatsoever. The linings of some 25 others would have to be torn out and replaced before operations could proceed.

The condition of the other 51 is such that they not only need relining but extensive repairs. First off, it is estimated that 20 of these 51 stacks are in such condition that they never will be operated again. This leaves 31 in the group needing extensive repairs.

Competent authorities estimate that there are 66 furnaces upon which vast sums will have to be spent for rehabilitation. Considering a stack relining cost, plus labor, at an average of $200,000, at least $13,000,000 will be necessary to eliminate this obsolesence factor. Rebuilding of shells, stoves, blowing engines, and other equipment would raise this repair bill to a minimum of $25,000,000.

Blast furnace operators also are faced at present with the problem of relining and repairing furnaces which are now making pig iron. In countless instances blast furnaces have been in operation for an extended period and within a short time will have to be blown out.

In the Pittsburgh district, embracing Pittsburgh city plants, Midland, Monessen, and Johnstown,

Less Pig Iron in Steel

Year	Production of pig iron, gross tons	Production of open-hearth and bessemer steel ingots, gross tons	Ratio of pig iron to steel ingots, per cent
1919	30,578,730	33,358,917	91.7
1920	36,400,968	40,463,602	90.1
1921	16,506,564	19,132,486	86.3
1922	26,850,844	34,349,800	78.2
1923	40,025,850	43,163,624	92.8
1924	31,076,572	36,564,084	85.1
1925	36,370,404	43,787,033	83.1
1926	39,100,941	46,597,475	83.8
1927	36,289,112	43,397,743	83.7
1928	37,831,741	49,865,185	75.8
1929	42,270,183	54,312,279	78.0
1930	31,441,488	39,286,287	80.2
1931	18,263,011	25,192,715	72.0
1932	8,674,067	13,322,833	65.1
1933	13,221,707	22,594,079	58.5
1934	15,977,679	25,599,118	62.4
1935	21,040,483	33,417,985	62.8
1936*	16,175,793	25,249,066	64.0

*Seven months.

Pig iron production compiled by STEEL; steel ingot production by American Iron and Steel institute.

Figures Tell Story of Diminishing Blast Furnaces

Year	Total blast furnaces, Dec. 31	Active blast furnaces, Dec. 31	Blast furnaces built during year	Blast furnaces abandoned during year	Blast furnaces remodeled during year	Annual capacity, Dec. 31, gross tons	Average daily production, gross tons	Average daily capacity per furnace, gross tons	Operations—production related to capacity, per cent
1918	435	351	.....	.....	.....	48,626,115	105,308	299	81.3
1919	431	262	2	6	7	49,628,000	83,777	309	62.8
1920	435	202	5	1	11	51,124,800	99,456	312	73.2
1921	429	123	1	7	3	51,924,075	45,223	327	32.3
1922	428	253	2	3	13	52,124,420	73,563	332	51.7
1923	418	231	1	11	5	52,146,430	109,659	341	76.6
1924	411	229	1	8	22	52,896,495	84,908	348	59.5
1925	386	234	1	26	10	50,830,790	99,645	377	68.7
1926	369	203	5	22	18	52,110,300	107,126	377	76.8
1927	354	169	.....	15	11	50,329,750	99,422	403	69.7
1928	335	155	2	21	12	51,069,895	103,365	412	75.1
1929	316	156	.....	19	17	51,490,680	115,808	443	82.8
1930	310	95	.....	6	14	52,515,875	86,141	455	61.1
1931	301	57	.....	9	6	51,598,175	50,035	479	34.7
1932	291	42	.....	10	3	50,313,975	23,699	486	16.7
1933	289	74	.....	2	4	50,975,561	36,223	477	26.3
1934	281	67	.....	8	6	50,845,741	43,774	496	31.3
1935	268	120	.....	13	1	49,777,893	57,694	520	41.4
1936 (7 mo.)	252	146	.....	16	4	.....	75,942	541	58.3
Total	.....	.....	20	203	167	.....	.....	.....	.....

Note—Capacity figures by American Iron and Steel institute; furnace operations compiled by STEEL.

Pa., but excluding Steubenville and Weirton, there are 60 steelworks blast furnaces.

Of these, 37 are in blast. Only four, or possibly five, of the remaining twenty-three can be blown in without extensive repairs. Moreover, location in some instances precludes blowing in some of these furnaces, from a cost standpoint. Out of the remaining 18, six stand in need of relining, where nine need more extensive repairs, and three likely never will operate again. Furthermore, of the 37 active, at least 10 have had fairly long continuous runs and are nearing a relining period. One or two in the latter group have exceeded runs of 1,000,000 tons without repairs.

In 1925 the American Iron and Steel institute became more critical of capacity figures, therefore set up a committee on special survey of capacity to compile a "practical" rather than a "theoretical" capacity figure.

In ascertaining this new base, the committee eliminated the capacity of a number of furnaces which had long been idle, and this accounts for the abrupt drop in capacity in 1925 as compared with 1924. This stricter determination of capacity seemed to speed abandonment and dismantling of obsolete furnaces. Of the 203 furnaces dropped since 1918, only 36 passed out of existence before 1925.

Elimination of many small capacity furnaces, building of the 20 large capacity units and rebuilding of the 167 existing stacks has steadily increased average daily capacity per furnace.

That an increasing percentage of scrap, and therefore a decreasing percentage of pig iron, is being used in the manufacture of steel is shown clearly in the accompanying table. The ratio of pig iron to steel in 1919 was 91.7 per cent, a figure which dropped rather steadily until only 58.5 per cent was reached in 1933; for the first 7 months of 1936 a percentage of 64 is indicated. Continued rising scrap prices are likely to raise this figure.

"Record" Furnace Run

When the "B" furnace of the Bethlehem Steel Co., Sparrows Point, Md., was blown out July 23, 1936, after seven years, four months, and twelve days of operation, it is believed a world's record for pig iron tonnage was established, with 2,009,057 tons produced. During this run the brick lining required no repairs whatsoever. The furnace, which was blown in March 11, 1929, is now down for relining. Harbison-Walker Refractories Co., Pittsburgh, supplied the brick lining on which the run of over seven years was made.

Steel's Uniform, Open-Price Plan Declared "Success"

SUCCESS of the open-price method of quoting steel products, inaugurated in March, has been so marked according to sellers, that its continuance is assured unless some factor not foreseen changes the situation. Prices for the fourth quarter have not yet been considered, but announcements are expected within two to three weeks.

Under the open-price plan, described in STEEL, March 16, page 66, the seller binds himself to adhere uniformly to his announced quotations, on all business, until he may decide to quote other prices, which also apply to all buyers alike.

One effect of this plan, in conjunction with the quantity differentials, was to eliminate many inequalities between rival purchasers. The steel consumer often is more interested in knowing that his competitors are not enjoying a price advantage than he is in the actual price he pays for steel. Under the open-price plan he is assured of equality.

As usual when the end of a quarter approaches there is much conjecture as to what prices will apply for the succeeding period. So far apparently no decision has been made by any steel company, but it is generally believed prices will remain at the present level or advanced. The preponderance of opinion, entirely unofficial, is that some products will be raised either at the outset or during the quarter.

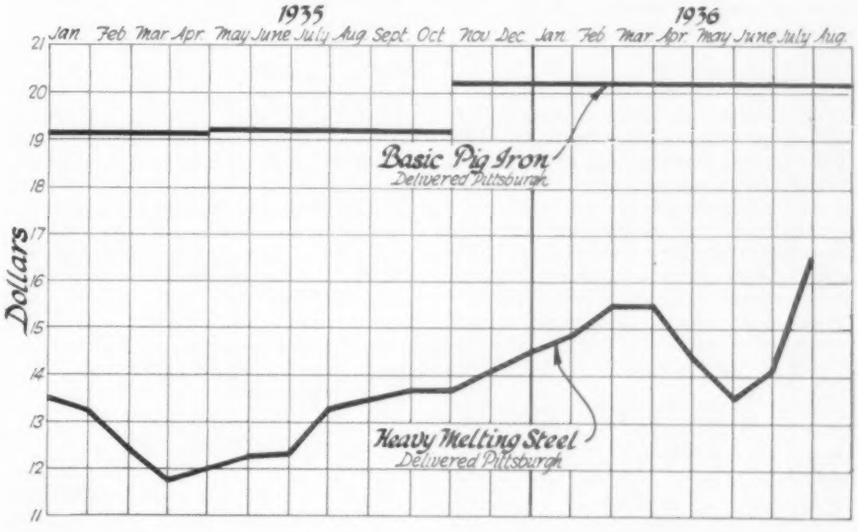
Reasons for this belief are based on the increasing price of scrap, which is making a spectacular rise, and heavier labor costs. With steelworks consuming larger tonnages, the price trend in scrap is sharply upward, with promise of reaching higher levels than for the past several years.

As scrap reaches nearer the price of steelmaking pig iron the tendency of steelmakers is to change the proportion of their mixture and use more iron, with less scrap. At present it is apparent that scrap is in short supply and collectors must go further afield, involving higher shipping costs.

The accompanying chart, showing average monthly prices of basic pig iron and heavy melting steel at Pittsburgh since the beginning of 1935, indicates the rapid rise of steelmaking scrap, and its near approach to the price of basic pig iron.

Incidence of the Robinson-Patman law, forbidding discrimination in prices as between customers of a seller, is expected to have considerable effect in aiding open-price maintenance. While the provisions of the

Scrap Advances Toward Basic Iron Level



PRICES of basic iron and heavy melting steel, competitive materials in production of open-hearth steel, from the beginning of 1935 are compared in the chart. The upward movement of the price of scrap, presumably caused by scarcity and heavy demand, has narrowed the spread between the two materials until their proportionate use probably will be altered. While heavy melting steel was $5.63 per ton below basic in January, 1935, it was only $3.71 lower in August, 1936

law are not yet clear sufficient knowledge has been gained to make sellers careful not to transgress such provisions as are plain. This, according to a number of sellers, probably will tend to prevent undercutting, and force uniform adherence to announced prices. So strong is the steel market today that some mills, knowing they cannot make deliveries before the beginning of fourth quarter, are accepting contracts for delivery at mill's convenience and at prices ruling at time of delivery.

Commission May Control Differentials; Cites Provisions in Patman Act

CONSTRUING some of the provisions of the Robinson-Patman act, the federal trade commission last week made it plain that it will endeavor to fix price differentials, where it considers them discriminatory.

Because of widespread interest in the act, the commission released a portion of its forthcoming annual report, in which it quotes provisions of the Clayton act, and in parallel columns points to the amendments, as contained in the Robinson-Patman measure.

Referring to quantity differentials, the commission points out that where available purchasers in greater quantities are so few as to render differentials on account thereof unjustly discriminatory or promotive of monopoly in any line of commerce it may, after due investigation and hearing to all interested parties, fix and establish quantity limits and revise the same as it finds necessary, as to particular commodities or classes of commodities. Thereafter in such cases differentials based on differences in quantities greater than those so fixed and established are not possible.

Other Provisions Important

"The new act includes some important provisions that are in the nature of extensions of the principle of non-discrimination," says the commission. "These extensions are independent of the prohibition against the discriminations in price as such. The method forbidden were evidently considered as either constituting indirect price discrimination or other forms of discrimination which had effects similar to price discrimination.

"The payment of brokerage, commission, or other compensation in lieu thereof to an intermediary is forbidden, except for services rendered, where the intermediary 'is acting in fact for or in behalf, or is subject to the direct or indirect control' of any party to the transaction other than the one paying the intermediary's compensation.

"Allowances for advertising and sales promotion work are declared unlawful unless they are made 'available on proportionally equal terms' to all customers who compete with one another.

"It is also declared unlawful to discriminate between purchasers of a commodity bought for resale by furnishing any services or facilities for processing, handling, selling, or offering for sale, that are not "accorded to all purchasers on proportionately equal terms.'

"The act provides that when the commission shall have established a *prima facie* case of 'discrimination in price or services or facilities' the burden of rebutting such a case shall be upon the alleged violator, and 'unless justification shall be affirmatively shown' commission may order the discrimination terminated. The theory of this provision is that the facts which constitute justification are necessarily in the possession of the alleged discriminator.

Definitions Differ

"Section 3 of the new act makes it a criminal offense and provides a penalty of fine or imprisonment of persons who knowingly discriminate or assist in discriminating. This section, however, sets up a definition of criminal discrimination which is not identical with the definition of discrimination contained in Section 2A to F inclusive of the new act.

"Section 3 of the new act also makes it a criminal offense to sell goods in any part of the United States at prices lower than elsewhere in the United States for the purpose of destroying competition or eliminating a competitor. It is also a criminal offense to sell goods 'at unreasonably low prices for the purpose of destroying competition or eliminating a competitor.' "

Financial

CAPITALIZATION of Continental Supply Co., & Tube Co., has been increased from $5,000,000 to $10,000,000. Continental Supply is Sheet & Tube's selling organization in oil fields. The increase was made through transfer of surplus of capital stock.

The parent company has liquidated the Youngstown Corp., and the Rex Pipe Line Co., both wholly owned subsidiaries. The Youngstown Corp., was a holding company organized under the laws of Delaware in 1928. It was no longer needed, officials said. Rex Pipe Line Co., operated a gas line in Arkansas taken over by Sheet & Tube some years ago.

DIVIDENDS DECLARED

Transue & Williams Steel Forging Corp., Alliance, O., has declared an extra dividend of 5 cents a share and the usual dividend of 15 cent, payable Oct. 1 to stock of record Sept. 15.

Crucible Steel Co. of America, Jersey City, N. J., has declared a dividend of $1 on account of arrears on preferred, payable Sept. 30 to record of Sept. 16. The same amount was paid on June 30 this year.

Directors of American Radiator & Standard Sanitary Corp. New York, recently voted a dividend of 15 cents on the common stock, payable Sept. 30 to stock of record Sept. 3. This marks the first payment on the common since March 31, 1932. The regular quarterly dividend of $1.75 a share on the preferred will be paid Sept. 1 to stock of record Aug. 24.

Michigan Steel Tube Products Co., Detroit, declared a quarterly dividend of 25 cents a share, payable Sept. 10 to shares of record Aug. 31. Similar dividend was paid in the preceding quarter.

Clark Equipment Co., Buchanan, Mich., declared a dividend of 30 cents a share on common stock and a regular quarterly dividend of $1.75 a share on preferred. Both are payable Sept. 15 to stock of record Aug. 27. Heretofore the company has paid 20 cents quarterly on the common.

Motor Wheel Corp., Lansing, Mich., declared a dividend of 25 cents per share on common, payable Sept. 10 to stock of record Aug. 20.

Chinese Nails an "Incident"

HOW someone in the Allentown, Pa., plant of the American Steel & Wire Co. made the Chinese angry is chronicled in the current issue of U. S. Steel News, United States Steel Corp.'s employes' paper.

Chinese carpenters like inscriptions on the heads of their nails. So a Chinese importer thought up a good one and supplied the company with a stencil.

The shipment of nails arrived "perfect in quality and specifications"—except the inscription was upside down. When the head was brought around so that it was right side up, it was reversed as regards left and right—very perplexing to the Chinese, causing them to hit their thumbs.

"Feverish Activity" in Great Britain; Nation Planned Well for Expansion

THAT executives of American machinery and equipment companies can learn much from the experience of their contemporaries in England is the conclusion of Charles J. Stilwell, vice president of the Warner & Swasey Co., Cleveland, based upon his observations during a two-month tour of the principal industrial countries of Europe.

Speaking before the Export club of the Cleveland chamber of commerce, Aug. 19, Mr. Stilwell related the high lights of this trip. "Everywhere in England," he said, "there is a spirit of feverish activity." In Sweden, Holland, Belgium and Switzerland he found manufacturers enjoying a "normal" to "better-than-normal" business. In Germany plants in the mechanical industries were found to be operating at capacity.

Conditions in Italy are improving, but the situation there is discouraging to American exporters, declared Mr. Stilwell. "Germany is a large customer of Italy. She purchases foodstuffs and other products from Italy in some quantity. Therefore, there is a clearing of exchange between Germany and Italy which allows Italy to repurchase from Germany those kinds of manufactured products which it is impossible for her to import from the United States for lack of dollar exchange."

"France," he declared, "provides a sharp contrast to the situation which prevails in practically all the rest of Europe . . . . with political developments of recent months, the confidence of manufacturers and merchants has been pretty badly shaken. They are in a period of depression that affects their ability to buy imported products in great quantity."

Interest in Experience of England

But of chief interest to American employers, in the opinion of Mr. Stilwell, is the experience of England.

"There," he reported," building trades are not only engaged in extensive programs of housing, but there is a very considerable activity and has been for several months in the erection of new and up-to-date industrial plants. Added to all this, England is now engaged in a program of furnishing its army and navy with new and up-to-date equipment. All of this translates into a tremendously abnormal demand for machinery of all kinds, chiefly machine tools.

"There is no longer any supply of skilled labor. Most manufacturers in England have been forehanded—more so than we have in the training of new men. Their build-up to the present peak has been more gradual and began farther back, with the result that I was amazed to see the number of young alert, wide awake men who have already been trained in positions of ability under a system that was inaugurated three, four, and five years ago.

"Industry in England is training up a new generation to handle her skilled jobs. This has gone on to such an amazing extent that in one shop I visited, employing several hundred men, I found in loking over the shop very few men who looked more than 40 years of age—most of them looked younger.

"I came away this trip more strongly impressed than ever that we must follow England's example of training skilled workers. A beginning has been made here, but it must be enlarged and carried forward actively, if we are to supply the iron and steel industry the tremendous demand that faces these industries in the near future.

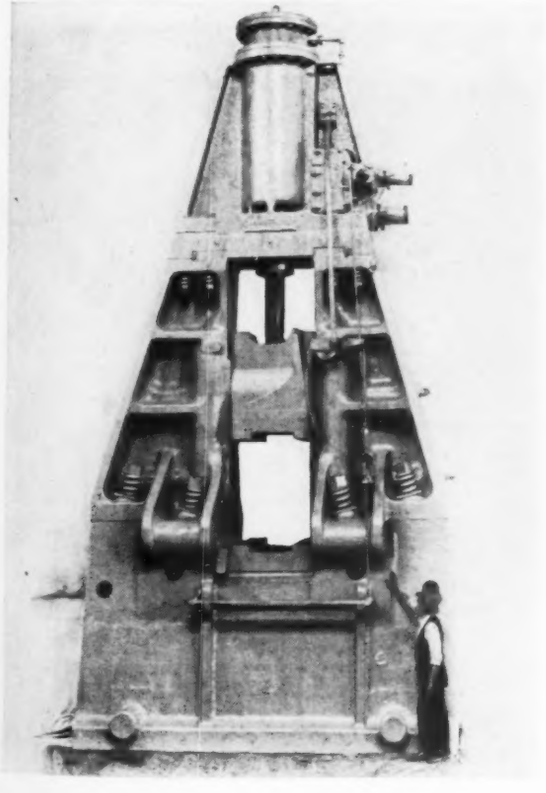
"I was told by several plant executives that in the present peak demand they are suffering for a want of raw material to almost the same degree as they are of skilled workmen. This is markedly so in finished steel.

Doubts Slackening of Pace

"Since my return I have been asked if this tremendous demand for machinery, particularly machine tools, is not equivalent to a war demand, and if after the present demand has subsided there will not be a terrific slump in these industries in England. Possibly so, but I question it. Notwithstanding the much-talked-of armament programs, the automobile companies are still the largest buyers of machine tools.

"Once the peak load for so-called government plants has passed, I believe the British manufacturers will continue to buy machinery to replace old, worn out, and obsolete equipment. The necessities of the great war taught England the need of efficiency in manufacture, not only in machinery but in all other lines. They are cutting metal in England today as fast or faster than we are. This all calls for good, up-to-date machinery. It all argues in my mind for a continuance of good demand in that country at least.

Titan of Forging Hammers To Make Buick Crankshafts



A RAM weighing 16,000 pounds, driven by a cylinder 25 inches in diameter, with 57-inch stroke, in this steam drop forging hammer weighing 500,000 pounds, will beat out crankshafts for Buick eights. It is sixth of its type furnished by Chambersburg Engineering Co., Chambersburg, Pa., for making Buick forgings and three of smaller capacity are on order. Crankshaft forgings are straightened by several Chambersburg 600-ton capacity quick-acting hydraulic presses

To Place Plaque on Bridge

American Institute of Steel Construction Aug. 26 will place a stainless steel plaque on the Lorain road bridge (illustrated, STEEL July 6, page 26), near Cleveland, designating it as the "most beautiful bridge of medium size" built in 1935. Fort Pitt Bridge Works is the fabricator. Presentation of the award will be made by C. G. Conley, Mount Vernon Bridge Co., president of the institute.

Production

STEELMAKING increased 1½ points last week to 72 per cent, a new high for the year, and highest level since May, 1930, when the rate was 73½ per cent. A contributing factor was the 4-point increase at Pittsburgh, following termination of employe vacations at several plants.

Chicago — Steelmaking operations averaged 72½ per cent last week, an increase of 1½ points. Out of a total of 41 steelworks blast furnaces in the district, 24 are now active.

Pittsburgh—Up 4 points to 72 per cent last week, based on operations of United States Steel Corp. local units at an average of 71 per cent and the independents calculated at 75 per cent. In spite of a decline reported by steel producers in volume of forward specifications received, operations as yet have shown no decline. Out of 60 steelworks blast furnaces, 37 are active.

Wheeling—Unchanged last week at 95 per cent, with 35 out of 37 open-hearth furnaces melting.

Detroit—Up 7 points to 100 per cent last week. Both mills are operating at capacity.

Cincinnati—Advanced 4 points to 76 per cent last week, when a leading mill added one open hearth. Nineteen of 24 furnaces are now active.

New England—Up 8 points to 78 per cent last week, with an increase to 82 per cent scheduled for this week.

Birmingham, Ala.—Based on ingot production, the steelmaking rate dropped 3 points last week to 64 per cent.

Cleveland—Down 2½ points to 79½ per cent last week, as National Tube Co. at Lorain took off one open hearth to operate 11. Otis Steel Co., put its eighth furnace in production last Friday, while Corrigan, McKinney division of Republic Steel Corp. continued with 13 active.

Youngstown—Declined 5 points to 74 per cent, due to employe vacations at plant of the Sharon Steel Corp., Sharon, Pa. The rate is expected to rebound this week, following termination of vacations.

Central eastern seaboard—Up ½ point to 50½ per cent. A slight recession in orders is noted. Backlogs continue and the delivery situation is unimproved.

Buffalo—Held at 81 per cent last week, with 30 open hearths still producing.

Steel Tows To Dedicate Dam

Dedication of the $5,500,000 Montgomery Island dam, six miles below Rochester, Pa., on the Ohio river, will take place Aug. 29. A river festival, including a procession of craft of all kinds from small steamers to heavy tows of steel, coal and gasoline, has been scheduled.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Aug. 22	Change	Same week 1935	Same week 1934
Pittsburgh	72	+ 4	43	10
Chicago	72½	+ 1½	60	29½
Eastern Pa.	50½	+ ½	33	20
Youngstown	74	— 5	60	21
Wheeling	95	none	76	26
Cleveland	79½	— 2½	21	15
Buffalo	81	none	37	†
Birmingham	64	— 3	35½	25
New England	78	+ 8	73	29
Detroit	100	+ 7	94	77
Cincinnati	76	+ 4	†	†
Average	72	+ 1½	52½	20

†Not reported.

Calvin Verity Heads Hamilton Coke & Iron Co.

Completion of negotiations giving American Rolling Mill Co. control of Hamilton Coke & Iron Co. was announced by Calvin Verity, vice president of the American company. The deal involved $8,000,000, one-half of which Armco already controlled. The Kopper Gas & Coke Co. received $4,000,000 for its holdings of common stock and to retire outstanding bonds and preferred stock.

Though a wholly owned subsidiary, the company will continue operations as the Hamilton Coke & Iron Co. At the first meeting of the new board of directors Calvin Verity was elected president; J. C. Miller, vice president; J. A. B. Lovett, vice president and general manager; W. D. Vorhis, secretary; M. A. Brawley, treasurer; and J. F. Watt, assistant secretary and treasurer. The board of directors consists of Charles R. Hook, Mr. Verity, Mr. Miller, Mr. Lovett, and C. L. Kingsbury.

The blast furnace is being rebuilt and enlarged, and will again be in blast early in September.

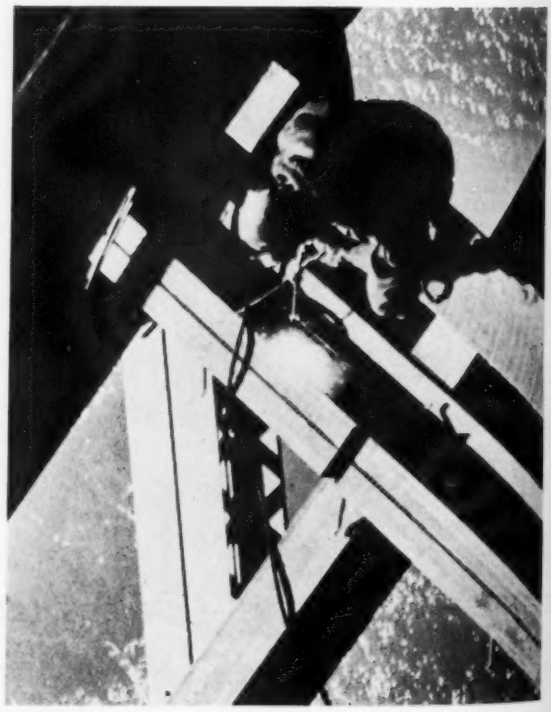
Index of Foundry Equipment Orders Rises

Index for foundry equipment orders for July was 159.6, according to the Foundry Equipment Manufacturers association, Cleveland. With the exception of 165.4 in May this year, this is the highest since March, 1931, at 174.4. Last year's July index was 93.3.

The index for shipments dropped from 153 in June to 145.7 in July. The unfilled order index rose from 130.8 in June to 144.5 in July. The three months' average of gross orders for July was 155.4 against 146.9 in the preceding month.

Jobbing foundries are engaged at the best rate since 1929. Gray iron foundry operations are estimated at 55 per cent of capacity. Malleable foundries are fairly active, but steel foundries have failed to show anticipated activity.

Electric Arc Welds Bridge High Over San Francisco Bay



HIGH above the waters of San Francisco bay the world's largest bridge, connecting Oakland to its metropolis, is being welded by the electric arc. Floor beams on the lower deck of the suspension span are being fused together, in the illustration. Earlier, giant pier caissons, one 92 x 197 feet, were fabricated by the same process. Equipment by Lincoln Electric Co., Cleveland, was used

Valley Steelworkers Cold to CIO Plans; Want Jobs

(*Concluded from Page* 15)

you think of that? And then you ask if we are interested in joining a union.

"Say," he cautioned, "keep that word off the tip of your tongue for it might fall out when you talk to some of the boys 'round here and they might mistake you for another guy."

And I thank him for the advice, as he put his finger on the labor pulse as it exists today throughout every steelmaking plant in the valley. The men are satisfied. They resent the presence of anyone who would attempt to disturb present working conditions.

Here is a typical illustration of what some of the foreign-born think about unionization. We will call him John Stanko. He works in the coupling shop of one of the district pipe mills. He never has been approached by an organizer, and wouldn't be interested if he did meet one. But let him tell his story.

"Men buy houses here. Some men he owe maybe $500, some men maybe $1000. Pretty soon no can catch 'em work. Mill go down. Oh, get 'em work may two, three days a week. By and by no get good pay. I go over to house company. I say, 'mister no can pay interest on house I buy. No get steady work; no get money.' You know what he say to me? He say 'Tha's all right, John, you no have to pay interest while work no good. When catch 'em nice pay, come back again.'

"Mister, for maybe three years I no pay any house money. She stand there just the same. But the company—he no ask me for money. By and by work she get better. I go over and start pay with man again. I have friend he lose house. Not me. I have house."

"Can't Beat That, Mister"

"What I join union for? He no help me buy house. Company treat me all right. No got work, no pay money. Can't beat that, mister."

And by the expression on his face and the movement of his hands while talking you could readily tell that this man meant every word he said.

One more illustration. This fellow was the blacksmith's helper, a Russian Pole. Here is what he told me during our conversation on the street corner.

"Union, you say, mister? What I care for union? You see this?"

And with this statement no sooner out of his mouth, he doubled up his fist. It was a big one. His arm started moving slowly but surely and when it stopped his clenched fist was parked directly beneath my nose. "That's what union man he get. I save that for him."

Right then and there, I decided never to become an organizer. Continuing he said:

"Long time ago I have good job. Work she no come right. Boss say 'you have to quit.' Can't buy meat, no got money. So I go to city. You call 'em relief house. They give me $3.50 a week. No can keep frau and kids on that. One day I get a letter, say come to gate.

"Right away I say, you get a job again. But no. Wait. Man tell me you got some day's work and order on comm'sary for $7.50 week. Just the same like $10 week for groceries and meat. Hard to get work then. But company help me and lot's of my brothers.

"Say, what kind of a man I am for to join union. What the company think of me, heh? No sir, me got good job, lot's a meat. I push 'em in nose back to Russia he say anything to me."

Creates Antagonism

Many more incidents could be cited to illustrate that at least 95 per cent of the steelworkers in the valley are antagonistic when the word "union" is mentioned. In fact, the word just isn't heard in the steelworker's conversation. It isn't in his vocabulary.

One fellow employed in a rod mill said in a casual way to one of the workmen in his department, "Where are those birds who are supposed to be organizing the district"? In reply to his question he was told, "Why bring up that question? What do you care, anyway? Soft pedal that stuff and forget about it."

That is the spirit which permeates every department in the various steel plants in the valley from one end to the other, based on observation and personal contact with the men themselves. They have their own representation plan. It's working. They don't want a union.

There may be talk of disturbance in the ranks of steelworkers in other districts, but so far as the Mahoning valley is concerned no one anticipates the unionization of those who man the steelmaking equipment.

The district is quiet from one end to the other, with the exception that there is a lot of noise coming over the fences surrounding the mill yards. For there is activity in every plant enclosure. Steel is being produced at a high rate, and the men are satisfied. What more can be said?

For a similar size-up of the labor situation in the Cleveland district see STEEL, *July 20, page 14.*

Meetings

AMERICAN SOCIETY OF MECHANICAL ENGINEERS is arranging a two-day technical meeting to be held at Hotel Niagara Falls, N. Y., Sept. 17-18, with power and hydraulic sessions scheduled so as to co-ordinate with the post-convention tours of the World Power conference in Washington, Sept. 7-12. Several European engineers will be speakers at technical sessions.

Wednesday, Sept. 16 will be spent in an inspection trip to the plant of the General Electric Co., Schenectady, N. Y. Among subjects to be discussed at technical sessions are power, hydraulics, transportation, process industries, materials handling in process industries, engine design, fuels and hydraulic research. Numerous inspection trips will be made to plants in the Buffalo district.

SCRAP INSTITUTE CONFERENCE

Institute of Scrap Iron and Steel will hold its midyear conference at Hotel Statler, Detroit, Sept. 9, it is announced by Darwin Luntz, president. The conference will open with a meeting of the board of directors, at which the Robinson-Patman price discrimination act and various problems of industrial relations will be discussed. A dinner, arranged by the Michigan chapter of the institute, will be served in the evening with Maurice Schlafer, president of the chapter, presiding.

FOUNDRY PRACTICE

Two-day conference on foundry practice is to be held at the University of Iowa, Iowa City, Iowa, Oct. 30-31, under sponsorship of the college of engineering, the American Foundrymen's association through its Quad-City chapter and the northern Iowa Foundrymen's association.

The program will consist of sessions on melting practice, sand control and other current foundry problems. This conference will be similar to the annual district conferences held at Michigan State college, East Lansing, Mich., and is one of several which the A. F. A. is assisting to develop for the purpose of bringing foundrymen together to discuss their mutual problems.

WASHER MANUFACTURERS

Plain Washer Manufacturers' association will hold its next quarterly meeting at Hotel Statler, Cleveland, Sept. 14-15. Part of the program will be a golf tournament.

Fire Long-Idle Furnace

Mackintosh-Hemphill Co. has resumed operations with its large No. 4 air furnace at its Garrison works, Pittsburgh, a melting unit which has not been operated since 1930.

Men of Industry

L. R. SMITH, formerly president, has been elected to the office of chairman of the board, A. O. Smith Corp., Milwaukee. W. C. Heath has been elected president, and J. M. Floyd, vice president in charge of manufacture and engineering.

Mr. Heath, formerly with Fairbanks Morse & Co., became vice president in charge of manufacture and engineering and a director of the Smith corporation in November, 1931.

Mr. Floyd was associated with Bendix Corp., South Bend, Ind., for many years. Other officers are R. F. Bell, vice-president; C. C. Joys Jr., vice president and director of sales; J. J. Stamm, secretary and treasurer.

L. R. Smith

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Frank J. Laskey, formerly assistant general purchasing agent, has been named general purchasing agent, Republic Steel Corp. Mr. Laskey came with Republic with the merger with Corrigan-McKinney Steel Co., where he was director of purchases.

Robert E. Sherratt becomes assistant general purchasing agent. Mr. Sherratt was formerly a buyer in Republic's purchasing department. He came to Republic at the time of its merger with Central Alloy Steel Corp. of Massillon, O.

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Lester L. Geil, Seattle has been named western manager of the office equipment division, All-Steel-Equip Co., Aurora, Ill.

♦ ♦ ♦

Walter E. Remmers has been appointed assistant to S. C. Dutot, district manager of sales at Chicago for Electro Metallurgical Sales Corp., New York. A graduate of the school of mines and metallurgy of the University of Missouri, he formerly was associated with Western Electric Co., Chicago.

J. M. Floyd

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E. L. Wyman, formerly vice president of Clayton Mark & Co., Chicago, maker of wrought pipe, has been elected to the newly created office of executive vice president, and Clarence Mark has been elected to the new office of chairman of the board. The office of president will remain vacant for a time in memory of Clayton Mark who founded the company and held the office of president from its organization to the time of his death July 7.

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R. E. Anderson has been appointed sales manager of the Delta-Star Electric Co., Chicago. He was graduated from the University of Michigan in 1913 with the degree of bachelor of electrical engineering and was engaged in engineering work with public utilities until 1918 when he joined the Thirty-seventh engineers of the A. E. F. He became affiliated with Delta-Star in 1920.

W. C. Heath

Elias S. Cornell has been appointed chief engineer of the Delta company, after serving as assistant chief engineer since 1930. He received his degree of electrical engineer from the University of Zurich, Switzerland, and before joining Delta-Star in 1926, was engaged in power plant design and construction with American utilities.

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R. H. Daisley has been made assistant general manager of the Wilcox-Rich Corp., Detroit. Mr. Daisley has been connected with the corporation for a number of years, particularly with the Saginaw plant, in engineering, sales and manufacturing capacities.

J. M. McKibbin

Who has been appointed manager of the newly created sales promotion department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., as noted in STEEL, Aug. 10, page 21

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H. D. Moskowitz, vice president, Schiavone-Bonomo Corp., New York, dealer in scrap iron and steel, returned last week from a trip to Europe.

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Percy R. Gardiner, Toronto, Ont., has been made vice president of Edge Moor Iron Works Inc., Edge Moor, Del., new name of the company acquired by Thomas J. Dillon and associates, New York, as reported in STEEL, Aug. 17, page 26.

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Peter M. Lorenz has been appointed by Inland Steel Co., Chicago, as district sales manager of the St. Louis office. Frederick A. Ernst has been designated as assistant manager.

Mr. Lorenz joined Inland in 1910. During the World war he served in the ordnance department, being stationed at Buffalo as chief army inspector of ordnance having charge

Peter M. Lorenz

of inspection at various eastern steel plants. From 1919 to 1921, Mr. Lorenz was in charge of the Detroit office of Inland and since then has been associated with the Chicago sales force.

Mr. Ernst first entered the steel industry in 1914 with the Trumbull Steel Co., Warren, O., and later was transferred to its Chicago office. In 1922 he became affiliated with the Falcon Steel Co., later becoming connected with Granite City Steel Co. and then Columbia Steel Co. In 1928 he became identified with the St. Louis office of Inland.

♦ ♦ ♦

George O. Clifford, president, Evansville Tool Works, Evansville, Ind., has resigned to become an executive officer of Fayette R. Plumb Inc., Philadelphia. A graduate of Wabash college and the Massachusetts Institute of Technology, Mr. Clifford obtained his early experience in the development department of the Goodyear Tire & Rubber Co.

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H. W. Schroeder, district sales manager at New York for Wheeling Steel Corp., 120 Broadway, sailed Aug. 19 on a brief trip to Europe.

Frederick A. Ernst

Died:

WILLIAM H. NICHOLLS, 57, president and founder of W. H. Nicholls Co., Richmond Hill, L. I., manufacturer of foundry equipment, in Glen Cove, L. I., Aug. 12. Mr. Nicholls had been prominent in the foundry equipment field for many years.

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Harry W. Dunn, 69, receiver of the Oil City Boiler Works, Oil City, Pa., at Oil City, Aug. 10.

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Alfred M. Wood, 46, general superintendent, Teleweld Inc., Chicago, maker of welding supplies, in that city, Aug. 10.

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George T. Haynes, 46, superintendent of Apollo Steel Co., Apollo, Pa., since March 1, 1935, at Apollo, Aug. 10.

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S. J. Gardner, 73, president and founder of the S. J. Gardner Foundry & Machine Co., New Albany, Ind., in New Albany, recently.

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Homer Whiteman, 55, purchasing agent and office manager of the Hooker Electro-Chemical Co., Niagara Falls, N. Y., for the past 25 years, in that city, Aug. 11. He was chairman of the chemicals section of the National Association of Purchasing Agents.

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Neal E. Townley, 41, president, Walcott Machine Co., Jackson, Mich., July 14, in Jackson. He had been president of the Jackson chamber of commerce.

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Rudolph T. DeLaval, 45, a mechanical engineer, with offices in New York City, at his home in South Orange, N. J., July 23.

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Frank Lyman Cone, 67, founder and president of the Cone Automatic Machine Co. Windsor, Vt., in Windsor, Aug. 14.

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Arthur N. Blanchard, 63, one of the founders and president of the Milwaukee Metal Working Co., Milwaukee, in that city, Aug. 11.

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Horace Coates Coleman, 70, vice president of the Wildman Mfg. Co., Norristown, Pa., knitting machinery, at his summer home in Colebrook, N. H., Aug. 11.

♦ ♦ ♦

Sir Marmaduke Winter, 80, president of the Standard Mfg. Co. Ltd., and the United Nail & Foundry Co. Ltd., St. John's, Newfoundland, in St. John's Aug. 12.

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Charles S. Cawthorne, 62, assistant treasurer, American Steel & Wire Co., at Lake Bluff, Ill., Aug. 14. In 1901 he became cashier of the American Steel & Wire office in Waukegan, Ill., and for the past 20 years had been cashier and assistant treasurer in the Chicago office.

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W. C. Dillingham, in charge of the tool and design section of the experimental division of the Packard Motor Car Co., Detroit, at Detroit Aug. 9.

♦ ♦ ♦

Frank J. Eppele, 72, for many years president of the Trenton Malleable Iron Co., Trenton, N. J., at his home in Sergeantsville, N. J., Aug. 10. In 1925 Mr. Eppele served as president of the National Association of Malleable Iron Manufacturers.

♦ ♦ ♦

Walter W. Clarke, 51, advertising manager, Hamilton Mfg. Co., Two Rivers, Wis., maker of printing house equipment, in that city, Aug. 13. He had been associated with the company since 1903.

Irvin F. Lehman

President and one of the founders of Blaw-Knox Co., Pittsburgh, who, as noted in STEEL, Aug. 10, page 22, died in Hartford, Conn., Aug. 5, after an illness of several months' duration. He had not been active in the affairs of the company or its connections for almost a year

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Ernest Love Baldwin, 64, president, Baldwin Belting & Leather Co. Inc. New York, manufacturer of machine belts. Aug. 12, after a week's illness in St. Peters hospital, Brooklyn.

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J. Harry Mull, 72, retired shipbuilder, who for a number of years was an executive head of the William Cramp & Son Ship & Engine Co., Philadelphia, in that city, July 27.

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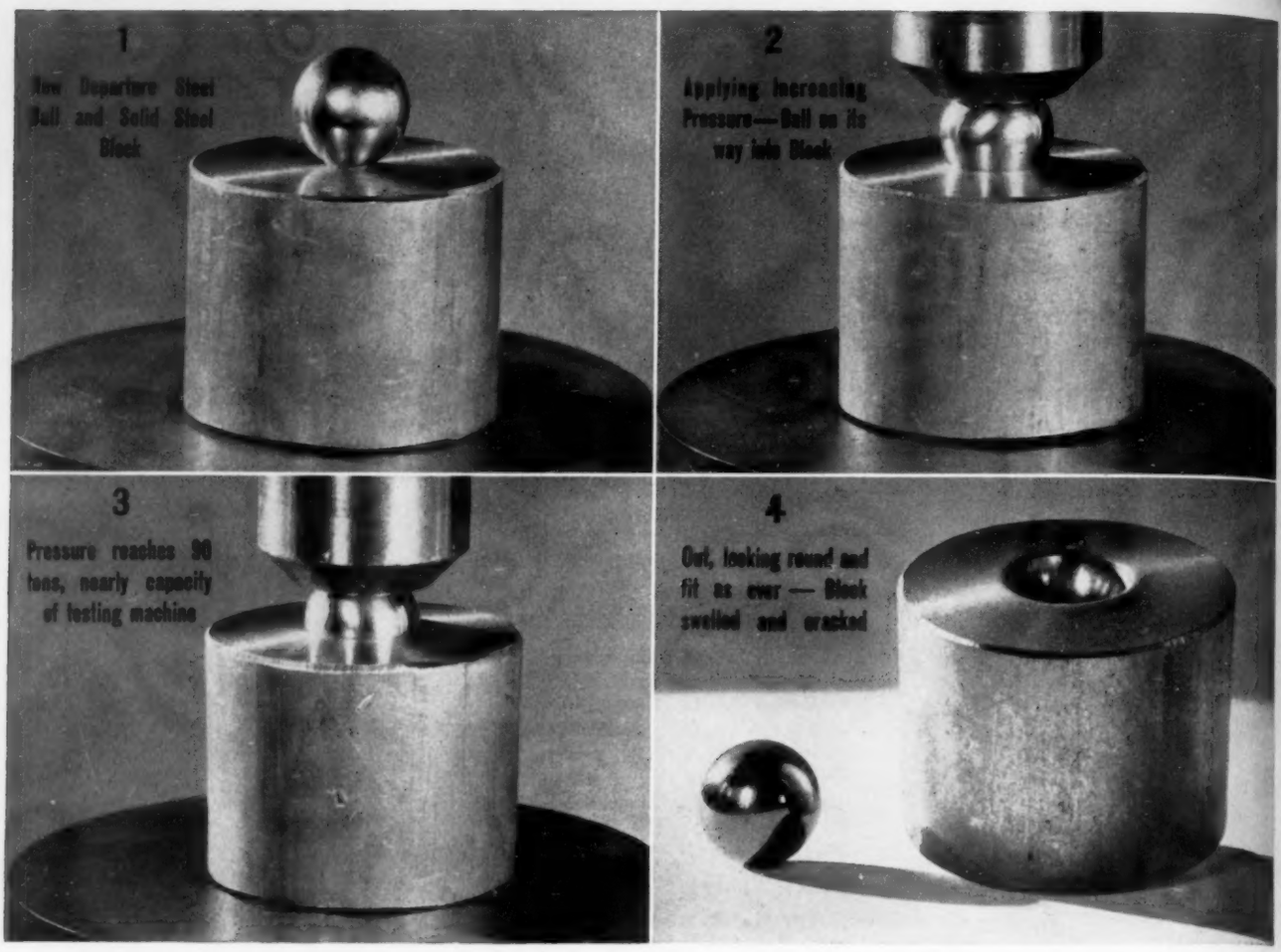
L. Heeley Link, 49, vice president and secretary of Bass Foundry & Machine Co., July 12 at Ft. Wayne, Ind. He had been identified with the Bass company for 33 years. He was president of the Indiana Manufacturers association, a member of the National Industrial council, and a director of the Ft. Wayne chamber of commerce.

—and No Other Form So Strong!


1
New Departure Steel Ball and Solid Steel Block
2
Applying Increasing Pressure—Ball on its way into Block
3
Pressure reaches 90 tons, nearly capacity of testing machine
4
Out, looking round and fit as ever — Block swelled and cracked

NATURE invented the sphere — the strongest form — but it has remained to man to produce it in steel, incredibly hard and tough.

These unretouched photos give indisputable evidence of enormous strength — of the ability of the steel ball to resist and survive tremendous loads.

Is it any wonder that a form so strong — that can be produced commercially with greater accuracy than any other shape — that is also the *easiest rolling* and the only form that resists loads with equal facility from any direction—should be chosen for the rolling members in the most efficient anti-friction bearing?

New Departure Ball Bearings, forged from the world's finest steel, are everywhere speeding the work of industry — promoting the business of transportation — they are accepted as the foremost anti-friction bearings.

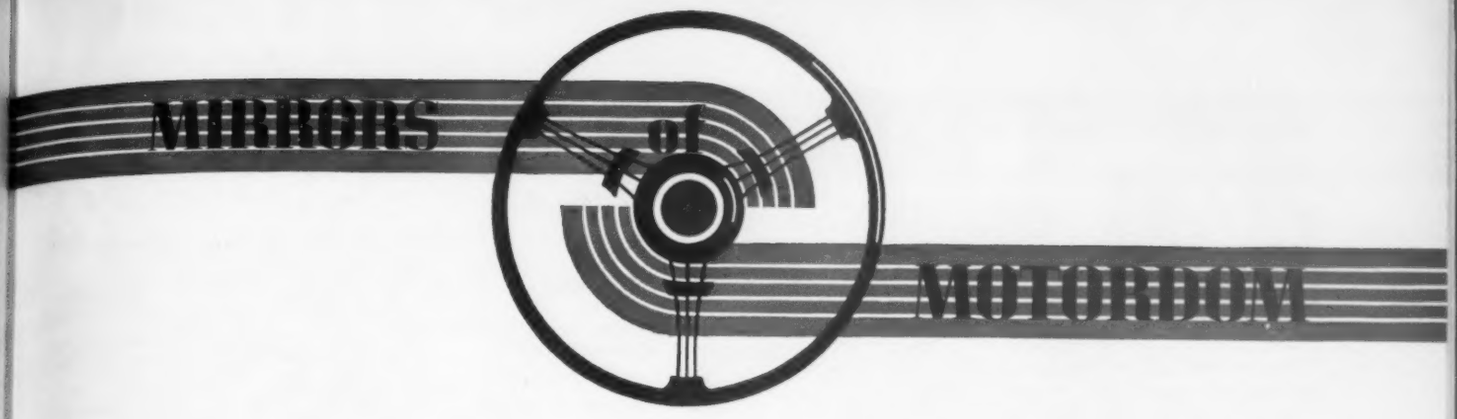
Nothing Rolls Like a Ball—
No Other Form So Strong

The New Departure Mfg. Co., Bristol, Conn. Sales and Engineering Offices: Detroit, Chicago, San Francisco, London, England.

NEW DEPARTURE

THE *FORGED STEEL* BEARING

2457



DETROIT

SOMEONE once said that the American people are all gypsies at heart. The amount of traveling in horse and buggy days lent credence to this statement, the automobile era made it certain, and now the house trailer brands the nation as almost condemned to wanderlust.

Changing the view from the front porch each night seems to be the vogue with an increasing portion of the population this year. "Tin can" tourists are everywhere. They seem to have found the answer to the 1936 desire for escaping from monotony, property taxes and the regulated order of existence.

This boom in what many dignify with the title, "mobile housing," has Detroit talking aplenty. For the city that took the early lead in the development of motor cars likewise wants parentage rights to what is now the nation's fastest-growing industry.

Trailers Surprise Industry

There are 97,000 members in the association which is known as the Tin Can Tourists of the World. It is a lusty, 10-year-old organization and not a comedian's conception. Yet this fad for vagabondage seems to have caught the automobile plants in Detroit flatfooted.

First off, every guesser of business curves a few years ago missed the boat completely. Many a sage talked of air-conditioning or television as the coming industry, but all overlooked the trailer as the infant that might supply the spark to break up the log jam in the affairs of the nation.

Secondly, the trailer idea is not new. In the early days of this nation supplies were hauled with wagon trailers. The westward colonizers knew what hitching onto a prairie schooner meant. Automobile trailers have been in use practically as long as the motor car itself.

In the past the idea had smacked of custom building. It was small wonder that firms like General Motors, Ford, Chrysler and some more had never seriously considered manufacturing trailers. Now, however, the whim of the public has made trailers front page news.

The motor makers' minds are grooving on the theme that the house trailer is here to stay. But none, at least none of the important motor car builders, has yet launched a manufacturing program.

For the time being, comprehensive surveys are being made, though. Two weeks ago General Motors dispatched word from its New York headquarters to a number of key men in Detroit subsidiary plants that it wanted a trailer survey made, particularly in detail. Such a move predates manufacturing, but not necessarily so. Ford and Chrysler have also perked up their ears, but neither has embarked.

In discussion with this department a week ago, remarks of an executive of one of the important independent automobile firms were typical of the attitude of a well-entrenched maker in the passenger car field. His idea was: Why make trailers when the motor car business itself is taxing all available facilities?

For the time being, then, trailers, although they hold prospects for considerable consumption of steel, probably will be made by a few of the motor car people who admittedly have excess capacity. Pierce-Arrow, already an entry into the field, serves as a good example. There are the Reos, Grahams, Hupps and a few others in motordom that conceivably could launch trailer building very soon. From all reports, some will.

Little Information Available

The motor people aren't the only ones to be caught flatfooted. Surprisingly, little information is available on the new industry, a fact which helps show what a novelty it is. There are no up-to-the-minute statistics on the number of makers, nor the number of units made.

By Dec. 31 probably 50,000 to 60,000 house trailers will have been turned out for the year. The largest maker alone, Covered Wagon Co., Mt. Clemens, Mich., should account for 10,000, followed by Silver Dome Inc., Detroit, and the others.

In regard to last year, the best estimates available say that around 300 different concerns in the country made house trailers and that about 6000 were turned out. Dividing 6000 by 300 leaves an average of 20 per firm per year, clear proof that many were made laboriously in backyard shops and not on continuous assembly lines.

Apparently, trailer makers have boomed for no other reason than congeniality, under the wing of the automobile industry. Of the 6000, better than 80 per cent were made in Michigan in 1935, mostly within a 25-mile radius around Detroit, this sector having some 75 plants of that nature. To many a veteran in the automobile business this is reminiscent of the early 1900's when most motor cars, too, were built by hand in scattered garages and small shops.

Taking the trailer out of the carpenter's shop and dropping it into the motor plant assembly line may be mirroring a page from the future but Pierce-Arrow will begin to do that in another week; Hayes Body Corp. at Grand Rapids will start soon.

What Is Demand Limit?

There are many guesses, even in astute circles, on the maximum limits of demand. Pierce says there is a market for 200,000 a year; others with a finger in the pie are less conservative and have a fact or two to show that the country's vagabonds will buy 300,000 a year. One imaginative authority, who thinks everyone's neighbors will be foot-loose before long, places his estimate at 1,000,000 converts yearly.

How much of a competitor the trailer will become for the steel house is not a matter for joking. So far, most purchases have been by retired individuals who like to live cheaply while seeing America first.

But the growth of trailer villages, as they sprouted in Florida last winter, may be a thrust at the housing problem. Steel, with a stake in both trailers and houses, may therefore see some shift by the time these two customers leave adolescence.

Just as nothing new in this country gets a foothold very long before some law clamps down, so the state legislatures have been caught unawares. Only a few automobile clubs have laid down the law on where

trailers may be parked, as the New York club did a few weeks ago, and very few associations, let alone lawmakers, have bothered on any other score.

State laws on safety in operation of trailers are now conspicuously lacking, but may be enacted to embrace regulations on proper frames, brakes and overall length limits. For example, only 14 states have laws now saying that trailers must have brakes and most of these laws are there as an incidental clause originally covering whatever form automobiles might take.

Whereas neighborhood carpenters are now building wooden trailers, or a combination of steel and wood, steel likely will replace it. Don't forget that the original Franklins all had wooden chassis frames.

The fact that the industry is still mainly in the custom-building stage should be hailed as encouraging for a wide future market in steel. Most trailers have been designed of wood largely because they are custom built, but quantity production and the appeal of safety will bring steel into the picture.

The Pierce-Arrow trailer, complete with hydraulic brakes and shock absorbers as well as independent wheel suspension, will be the first really designed by automobile body and chassis engineers. Steel has been specified in the chassis, body frame and panels, as well as in the roof. Hayes Body also will start with steel for the frame complete and for part of the side sections.

Additional Steel for Tops

Turning from the automobile's coming appendage and looking at the entire industry in items of steel for next year, the material seems likely to be in use on a greater scale than ever before. The largest new use, of course, will be in the all-steel top which General Motors pioneered for its lines in 1935 and which Chrysler and Ford will now follow in entirety in 1937.

Roughly, 25 pounds per car more of flat-rolled steel will be taken as replacement for the fabric top by the Chrysler units and Ford. Too, like General Motors, the entire top panel will be a single-piece stamping without any lengthwise welds.

However, Ford will go General Motors units one better in taking a single sheet and drawing from it the entire top, plus front cowl section, plus read panel right down to the horizontal body bead. Though from first appearances a scrap loss of 25 to 30 per cent might be evident, small stampings will be made out of the cut-out windshield piece. Willys, another convert to all-steel top for 1937, practically makes the feature inclusive in motordom.

Right now it's a race between Packard and Studebaker, closely pressed by Olds, to see which comes through first on 1937 car announcements.

Studebaker has definitely settled on a coast-to-coast dealer debut for Sept. 15 and has already shown the new Dictator and President lines to selected automotive technicians and newspaper men.

But the odds favor Packard to pull the rabbit out of the hat and be out sooner than that. Following Packard custom of earlier years, the day after Labor Day, Sept. 8, is being mentioned as the day for the debut. Which is all the more interesting because Packard has its complete new line of sixes on tap—the only brand new motor series to be brought out by any of motordom's big names for 1937.

Closely behind Packard and Studebaker, in that order named, is likely to be Olds, picked by the General Motors command to be the standard bearer. Buick, LaSalle, Cadillac and Pontiac, will all predate Chevrolet this fall. Chevrolet will be the last of the General Motors lines out.

Ford, still embroiled in changes on the 1937 line, can be out most anytime in the fall, although it will not be immediately because 1936 models are still being assembled at Dearborn.

Practically all of the new automobile plant builders, representing expansion for the 1937 season, are now nearing completion in the Detroit district. Outstanding have been the new plants contracted for by Oldsmobile, Buick, Chevrolet, Pontiac, and DeSoto.

However, last week it became known that General Motors was about to build a large plant and office building at Elizabeth, N. J., presumably for export business, although it closely duplicates the Baltimore, Md., assembly plant which Chevrolet built in 1934. The new Elizabeth plant is 1090 feet long, 600 feet wide, and has a number of 60-foot aisles. Complete with a large office building and loading dock, the expansion will be one of General Motors largest this season, closely paralleled by the Grand Rapids, Mich., expansion of Fisher Body.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1934	1935	1936
Jan.	155,666	289,728	364,004
Feb.	230,256	332,231	287,606
Mar.	338,434	425,913	420,971
Apr.	352,975	452,936	502,775
May	330,455	361,107	460,565
June	306,477	356,340	454,487
July	264,933	332,109	*432,329
7 mo.	1,979,196	2,550,364	2,922,737
Aug.	234,811	237,400	.....
Sept.	170,007	87,540	.....
Oct.	131,991	272,043	.....
Nov.	83,482	395,059	.....
Dec.	153,624	404,528	.....
Year	2,753,111	3,946,934	.....

Estimated by *Cram's Reports*

Week ended:

Aug. 1	95,970
Aug. 8	81,804
Aug. 15	56,679
Aug. 22	73,709

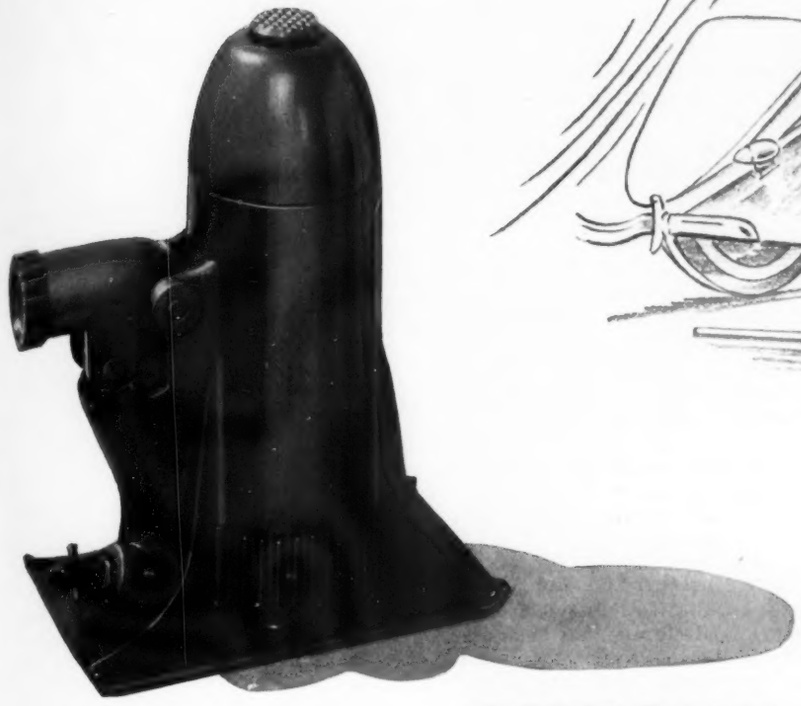
*Estimated.

Pontiac Taxis in Japan

General Motors of Japan has sold 23 Pontiac sixes for taxicab service at Hiroshima, Japan . . . Soss Mfg. Co., Roselle, N. J., and Detroit, has booked a contract for rear-compartment lid hinges for Plymouth, Dodge, DeSoto and Chrysler until July 1, 1937 . . . Colored rubber running boards, matching body colors, will be a feature on several of the 1937 models . . . The motor governor protagonists now lay claim to fuel savings, rather than increases, in a motor's acceleration when equipped with a governor . . . . Mullins Mfg. Co. has been signing up a number of Ford, Chevrolet and other automobile retail outlets recently as sales agents for the small trailer it makes . . . Federal Motor Truck Co. has introduced a new ¾-1-ton, six-cylinder, truck . . . . Chevrolet truck sales for 1936 to date are now 20,000 units higher than they were in the same period of 1929 . . . All the General Motors plants except Chevrolet and General Motors trucks remained closed last week . . . Assembly for the industry was led by Chevrolet then by Ford, Plymouth, Dodge, and Hudson in the order named . . . . Some idea of the shortage of skilled tool and die makers is evident in the local requests before the Employers Association of Detroit for over 450 jobs, applicants for which are only coming through at an average of 8 daily . . . Although most of the tool and die contracts are nearing completion, a number of small die jobs are being negotiated.

The Research was done, the Alloys were developed and most Die Castings are specified with

HORSE HEAD SPECIAL (99.99+% UNIFORM QUALITY) ZINC

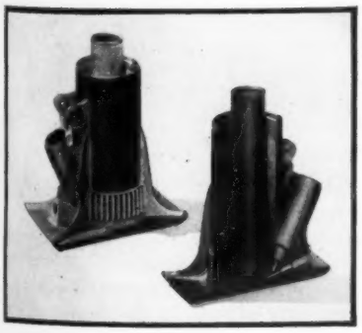


60 TONS BEFORE BURSTING!

It is because modern product designing demands the rigid testing of new materials and methods of manufacture that—before a ZINC Alloy Die Casting was specified as a combined cylinder, reservoir and pump for this automobile jack—a die cast cylinder similar to that of the pressure chamber in the jack was given a severe hydraulic pressure test. It withstood *60 tons before bursting!*

Coupled with this extreme strength was the ability to fabricate, with complicated coring the complete jack body and housing in a single ZINC Alloy Die Casting. Three smaller ZINC Alloy Die Castings complete the assembly of this jack, bringing production costs to an absolute minimum.

Does this example suggest possible economies in your products? Our Technical service staff will be glad to answer specific questions on the possible application of ZINC Alloy Die Castings.



We try to keep abreast of the Die Casting industry in our publication, The Alloy Pot. *We will gladly place your name on our mailing list to receive the literature on this subject if you so desire.*

The New Jersey Zinc Company

160 Front Street (New Jersey Zinc) New York, N. Y.

Activities of Steel Users and Makers

WIDENING use of 14 gage blue annealed sheet steel, formed and electric welded, is evident in construction equipment for shoring, trench bracing and scaffold splicing. In each case the steel forms replace wood and the need for plates under shoring is eliminated. Claims that steel shoring effects a large labor saving in making up, erecting, and stripping, as well as a saving of time ordinarily spent in leveling and cambering forms, have been made by the Construction Specialties Co., Oliver building, Pittsburgh, which is marketing this unit in steel splice and tee forms in 12 and 18-inch overall size.

♦ ♦ ♦

Goebel Brewing Co., Detroit, has installed automatic canning equipment for packaging its beer in cans.

♦ ♦ ♦

Parsons Engineering Co. has moved from 2035 West 105th street to 2611 Cedar avenue, Cleveland, where larger quarters are available for increased manufacturing.

♦ ♦ ♦

Claude B. Schneible Co., Chicago, has appointed W. F. Dalrymple, Bowen road, Elma, Erie county, New York, its representative in Buffalo territory for Schneible multiwash dust collectors. Complete engineering and equipment sales service will be rendered.

♦ ♦ ♦

Timken Roller Bearing Co., Canton, O., has received an order from Canadian National Railways for bearings to equip the engine trucks of four passenger locomotives. The application will be made in the Canadian National shops at Montreal.

♦ ♦ ♦

J. L. Vergilio Co., Cleveland, has been appointed sales agent in northern Ohio by the Ohio Electric Mfg. Co., Cleveland, manufacturer of fractional horsepower motors. J. L. Vergilio and D. S. Cole will be active in the application and sales for this company.

♦ ♦ ♦

A. L. Cavedo & Co., Richmond, Va., miner and shipper of molding sand, has been appointed sales agent for the Federal Foundry Supply Co., Cleveland, in the southeastern section which includes Virginia, District of Columbia, North and South Carolina, and eastern Tennessee. N. L. Cavedo, vice president, will be in charge of the Federal line.

♦ ♦ ♦

Bar-Pat Co., 324 South California street, Stockton, Calif., manufacturer of pressure pumps, is expanding its field with three newly developed power farm machines, a combined harvester, a power mower and a weed exterminating machine. The new harvester is steel electric welded throughout. I. L. Barnickel and E. J. Paterson are founders of the firm.

♦ ♦ ♦

United Cinephone Corp., electronic division, recently completed a new plant at 43-37 Thirty-third street, Long Island City, N. Y., for the manufacture of all kinds of photoelectric controls for commercial and industrial applications, including controls for various steelmaking operations. The company has brought out a new automatic control for use on conveyor systems.

♦ ♦ ♦

Production in the second unit of the Niagara Falls plant of the Aluminum Corp. of America, Pittsburgh, is to be resumed about Sept. 15, company officials announce. Smelting of aluminum ore will be the principal operation. This will be the first time since 1931 both units of the Niagara Falls plant have been in operation. New equipment is to be installed prior to reopening of the unit.

♦ ♦ ♦

Herberts Machinery Co. Ltd., 2929 Santa Fe avenue, Los Angeles, over the past several months, has been appointed exclusive representative in southern California and Arizona for the following machine tool manufacturers: American Tool Works Co., Cincinnati; Bardons & Oliver Inc., Cleveland; Bryant Chucking Grinder Inc., Springfield, Vt.; Chaso Tool Co. Inc., Royal Oak, Mich.; Ex-Cell-O Aircraft & Tool Corp., Detroit; General Machinery Co., Hamilton O.; International Machine Tool Co., Indianapolis; Mattison Machine Works, Rockford, Ill.; National Broach & Machine Co., Detroit; Oster Williams Co., Cleveland; Racine Tool & Machine Co., Racine, Wis.; Reed-Prentice Corp., Worcester, Mass.; Sebastian Lathe Co., Cincinnati; Superior Machinery & Engine Co., Detroit; Whitney Metal Tool Co., Rockford, Ill.

♦ ♦ ♦

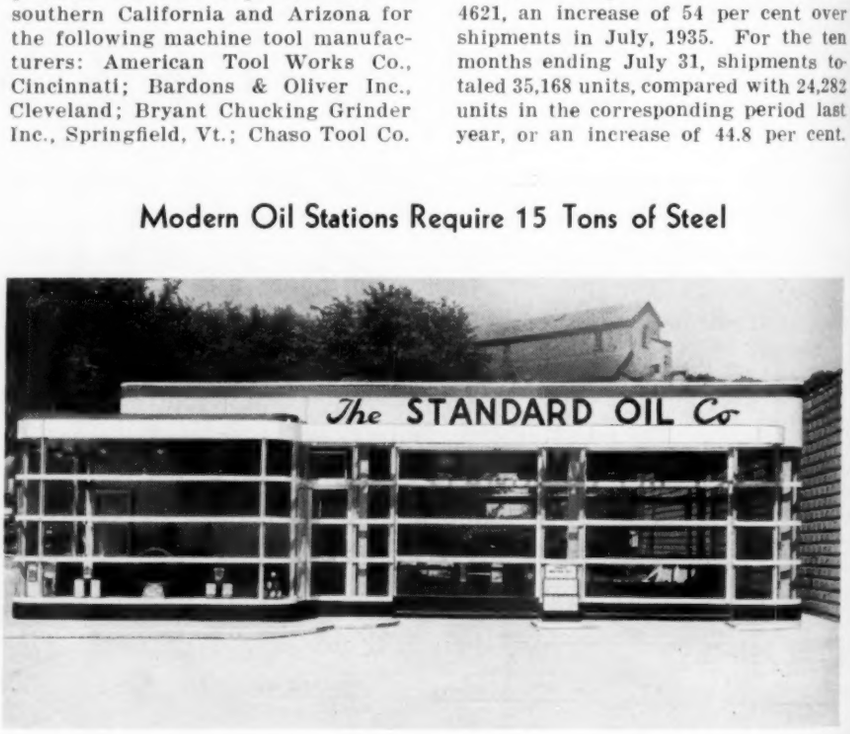
Bushwick Iron & Steel Co. Inc., has been formed by merging the Bushwick Wrought Iron Works Inc., Brooklyn, N. Y., and Peter Cappio & Co. Inc., New York. The company is located at 116 Green street, Brooklyn, and does a jobbing business in hot rolled steel products. A. Perlen is president and Peter Cappio, treasurer.

♦ ♦ ♦

Kelvinator Corp., Detroit, reports shipments of Kelvinator refrigeration products for the ten month fiscal period ending July 31 were 297,435, compared with 222,336 units for the corresponding period last year, or an increase of 33.8 per cent. Oil burner shipments for the same period exceeded by 75 per cent shipments for the entire previous fiscal year.

July shipments of Kelvinator commercial refrigeration units totaled 4621, an increase of 54 per cent over shipments in July, 1935. For the ten months ending July 31, shipments totaled 35,168 units, compared with 24,282 units in the corresponding period last year, or an increase of 44.8 per cent.

Modern Oil Stations Require 15 Tons of Steel



CORRUGATED metal service stations in some localities are being replaced by streamlined buildings of porcelain enamel and glass. Fifteen of the type shown above have been built by Standard Oil Co. of Ohio since spring, and 10 more are under construction. The Austin Co., Cleveland, expects to complete 100 porcelain enamel stations throughout the East and Middle West before the end of this year. About 15 tons of structural shapes, lighter gage special formed shapes and sheets, including enameling stock, are used in the average building

WASHINGTON

TWO foreign developments last week were of special interest to the iron and steel and machinery industries. They were the German countervailing duty situation and the fighting in Spain, the latter leading to considerable misunderstanding relative to our neutrality laws.

Government departments have been receiving mail indicating that American manufacturers have been under the impression that this country cannot export arms or ammunition or anything else to Spain under our latest neutrality law. This is not so. The law provides that we cannot export such materials to warring nations, but it has nothing to do with civil war such as now exists in Spain.

Considerable iron ore is mined in Spain. These mines are owned for the most part, it is said here, by British and Scottish interests and therefore the bulk of the ore finds its way to the British Isles. It is only occasionally that any of this ore finds its way into this market.

Promises No Interference

In connection with the neutrality situation and the misunderstanding about Spain, the state department says that "it is clear that our neutrality law with respect to embargo of arms, ammunition and implements of war has no application in the present situation in Spain since that applies only in the event of war between or among nations.

"On the other hand in conformity with its well established policy of noninterference with internal affairs of other countries, either in time of peace or in the event of civil strife, this government will, of course, scrupulously refrain from any interference whatsoever in the unfortunate Spanish situation. We believe that American citizens, both at home and abroad, are patriotically observing this recognized American policy."

In the German situation, many guesses are being made by department of commerce officials as to just what will become of the iron and steel and machinery trade between the two countries.

There is a great deal behind the scenes in connection with the withdrawal by Germany of all bounties paid by the German government to firms exporting to America, including the abolishment of the use of the aski mark and the barter system, said to have consisted of more than 60 per cent of the trade between the two countries for some time past now.

A very decided misunderstanding has arisen about the whole aski mark situation, due to the fact that the newspapers announced that the German government had abolished the barter system and the use of the aski mark in the German-American trade as a reprisal against our placing a countervailing duty against certain German goods. This was not so. The use of the aski mark and the barter system were actually the payment of bounty to German exporters and their withdrawal has evened up matters, according to those who have made a close study of the matter both in the department of commerce and the customs bureau of the treasury department. However, even these persons who have been so close to the picture refuse to hazard a guess as to what the future commercial relations are going to be in view of the fact that from now on German purchases here must be paid outright in negotiable currency.

Effect Uncertain

The department of commerce has a cablegram from the American commercial attache at Berlin, Douglas Miller, in which he cautions American exporters that aski marks created by American exports entering Germany after Aug. 3 are unusable for any purpose under the new German regulations and are of doubtful value now.

There has been considerable trade between the United States and Germany even recently in iron and steel products and machinery, especially the latter, and whether these last steps have helped or hindered this trade is not known here yet.

Of course, the American government has now withdrawn its countervailing duty order against certain German commodities in view of a note from Germany that the bounties will no longer be paid by the German government on exports from Germany.

ADMINISTRATION TRIES TO AVERT ADDITIONAL TROUBLE

The labor front was quiet here last week but the apparent inactivity was not entirely accidental. The administration has been doing everything it could to quiet the A. F. of L. and the CIO until after election.

With Edward McGrady, assistant secretary of labor, and others doing yeoman service for Mr. Roosevelt, the necessity for curbing further squabbles has been brought forcibly before labor leaders. The administration hopes to keep the labor situation under cover until after November. After that, apparently, the President doesn't care much what happens in labor circles.

There is considerable to think about for the administration in the labor situation. John Lewis and his CIO have come out absolutely for Mr. Roosevelt and also have indorsed him through the so-called nonpartisan league headed by Maj. George L. Berry. Of course William Green of the A. F. of L. also has come out for the President, but this is strictly personal. Mr. Green has given official notice that the A. F. of L. is for no candidate.

Those on the side lines are having a good laugh at the nonpartisan league because its name is so misleading. The major himself has stated that there is only one reason for the league and that is to help re-elect the President. As an afterthought he says that the league's work will

continue along its political way even after election.

Maj. Berry has moved his office into the Tower building in Washington, where several unions are located and this makes it possible for the major to kill a good many birds with one stone. He tried to insist on retaining his offices in the department of commerce building but this was just one of the things that Secretary Roper could not stomach.

John Lewis folded his tent last week and stole quietly away in the dark to Europe. Even the press did not know that he had gone away until a few days later. When it was discovered, the labor folks at his headquarters said that he had gone abroad to confer with Miss Perkins. They probably did not realize that it would have been necessary for Mr. Lewis to change ships in mid-Atlantic to meet the secretary of labor, because she was on her way back when Lewis left. While no one seems to know just why he is making the trip, it is generally supposed that he is seeking rest, to get a little more energy to try and unionize the steel industry.

DETECTIVE REPORTS STUDIED IN ESPIONAGE INQUIRY

The LaFollette subcommittee of the senate, looking into espionage and other labor conditions, was scheduled to meet last Wednesday, but postponed its hearing for a few more days.

It is believed here that the steel industry will be much in evidence when these hearings actually start because the industry already has been accused before the committee of all kinds of dire threats against labor.

The subcommittee asked certain private detective agencies to file documents with it and it is generally understood here that when these papers are filed the committee will adjourn to allow its experts to tabulate the information and call hearings sometime between the middle and the latter part of September. It is possible that some field hearings will be held.

CARRIERS SEEKING TO AVOID EXPENSIVE ACTIONS

The railroads, following repeated conferences, are still wrestling with the problem of the freight surcharge rates which expire next Dec. 31 and which the roads want to keep in effect if possible. They have already been turned down once by the interstate commerce commission on continuing these rates and so in order to be successful they have to overcome this precedent.

It is whispered here by those supposed to be in "on the know" that it would cost the roads between half and three quarters of a million dollars to file individual applications for commodities. The roads are trying to find some other way, but up to this writing they have been unsuccessful. There is a general feeling that they will ask to retain the surcharges on freight that will bear it. Whether a commodity can bear the cost probably will be decided by just how loudly the protests are made. That puts the iron and steel rates squarely up to the iron and steel industry itself.

SAYS BUSINESS MEN HAVE CAUSE TO REJOICE

Assistant Secretary of Commerce Ernest G. Draper, former business man, who is now helping to campaign for the President, asserted before a luncheon group last week that a recent survey indicates that business men have more cause for rejoicing than any other one class of citizens in the entire nation. He based his statement partly on the statistics of national income which the department of commerce compiles.

"The low point of income in 1932 was about 39 billion dollars," he said. "Preliminary estimates for 1935 show a return to approximately 53 billion dollars and for 1936, close to 60 billion dollars. From the construction trades, where momentum is beginning to gather, through all stages to the automobile industry, where former peak records are now being eclipsed, the reborn confidence of those who constitute the mass markets of industry has stimulated this recovery."

TAX COMMITTEE MEETS SOON AFTER LABOR DAY

The iron and steel industry undoubtedly will be much interested in whatever conclusions the joint congressional tax committee reaches when it meets next. Announcement has been made that it will meet shortly after Labor Day. However, it is not to be assumed that many hearings will be held at that time because many members of the house have political fences still to be patched before they come back here to work, tax bill or no tax bill.

Newspapers of the nation were not at all taken in last week when the President made his announcement on no new taxes and no increase in present taxes. Since that time several other statements have been made by the secretary of the treasury and the treasury department relative to the unusual amount of money now flowing in due to better business conditions. It is not conceivable that the department's experts were so dumb a couple of months ago when they were still working on the tax bill, that they could not tell from the trend of business that treasury collections would be far better than they have been.

As a matter of fact, government officials have been rather surprised that they have not received more kicks from industry on the latest tax bill, but some of them undoubtedly realize that industry has stopped kicking to Washington because it never gets any help—not even a breathing spell when that is promised.

EXPORT LICENSES VALID UNTIL NEXT DEC. 31

The secretary of state has notified the secretary of the treasury and the collectors of customs throughout the country that all licenses issued for tin plate scrap between July 1 and Dec. 31 will be valid up to and including next Dec. 31.

There is not likely to be anything new in this situation now, but before long figures will be available at the department of commerce showing whether more or less scrap was exported during July. Since that was the first month it was necessary to have licenses for export, a comparison will be available with the same month of last year. Officials of the state department, it has been reported, were surprised that they did not receive more applications for tin export licenses prior to July 1. They had been expecting that they would have to turn down some applications, but this was not the case.

The department has announced that it will consider further applications for the present six-month period. It is anticipated that the export licenses will be issued to interested parties every six months—at least that is the present intention.

Sets Up Import License on Autos

Australia has decided to encourage manufacture of motor cars and an import license has been set up for motor chassis and bodies from countries outside the United Kingdom, says the statistical bulletin of the British Iron and Steel federation, London. Establishment of the domestic industry is to be encouraged by a bounty, funds for which will be derived from a duty of 7 pence per pound on imported cars. Manufacture probably will not be started until 1938 but imports of cars from North America are to be limited to the number imported in the twelve months ended April 30, 1936, it is understood.

John Lysaght Ltd. has completed plans for rolling steel sheets for motor bodies at Newcastle, N.S.W. and additional mills to cost about £500,000 are to be installed. It is reported that Armco (Australia) Proprietary Ltd., an associate of Armco International Corp., owned by American Rolling Mills Ltd., proposes to erect mills to roll sheets for the same purpose. Cost of the works, including foundry and rolling mills, is estimated at £1,000,000. This report is not yet confirmed.

Editorial

England's Experience Teaches "Prepare for Prosperity"

RECENT reports from Europe reflect certain developments which should prove interesting to the executives of hundreds of American industrial companies. We in the United States who still are climbing out of the valley of depression can learn much of profit to ourselves by studying the experience of the several European countries which, having scaled the incline from the depths, now are on the crest of a post-depression plateau.

Elsewhere in this issue (p. 19), Charles J. Stilwell presents a summary of impressions gained during a two-month visit to the principal industrial countries of Europe. The picture of general prosperity he depicts for all nations except France conforms in essential detail with that reflected by STEEL's quarterly summaries of European conditions and its weekly cabled reports on iron and steel markets in England and on the continent.

Significant to American builders of machinery and allied equipment is the fact emphasized by Mr. Stilwell that much of the activity he witnessed abroad is the result of a far-reaching necessity for rebuilding, rehabilitation and expansion to make up for years of inactivity during depression. No one, including Mr. Stilwell, will deny that preparation for hostilities is a factor in the prosperity in certain localities, but in the main it is secondary or supplementary to intentive activity which was first stimulated by normal, peaceful economic necessity.

England's Strenuous Activity Is Based Upon Need for Making Up Depression Deficiencies

The "spirit of feverish activity" now prevalent in England grew out of a slow, painful process of recovery in which an extensive home building program was one of the principal stimulants. This activity in residence construction expanded into a revival of industrial plant construction. Repercussions extended into other fields, which in turn have been transformed into an abnormal demand for materials, machinery and allied equipment.

In this respect England probably is now going through an experience we will face sometime in the future. Americans will do well to heed the lessons which England's present experience teaches.

First is that the accumulative effect of the processes of sound recovery provides a volume of work for industry that is likely to be underestimated rather than overestimated. Construction of new plant facilities in the United States still is limited in volume. If England's experience is an accurate criterion, we shall see a great expansion and replacement in industrial building. This, of course, will involve heavy expenditures for equipment, and it is likely that the present demand for machine tools is but the forerunner of a much heavier volume of purchasing.

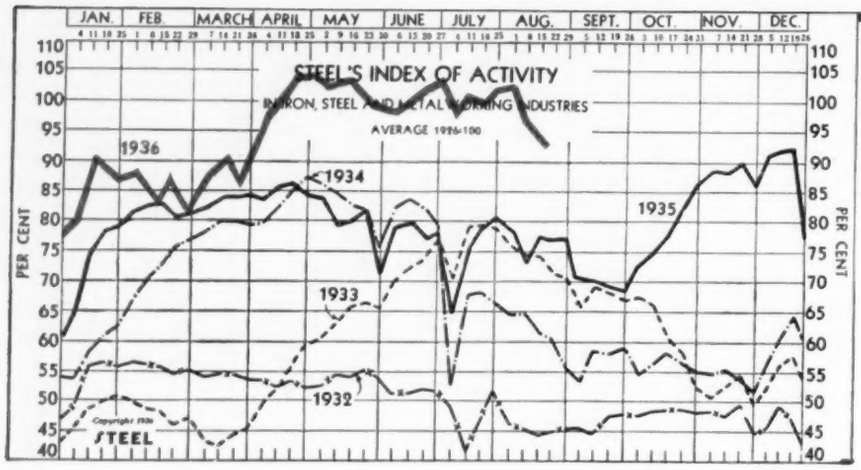
Increased activity in the machinery equipment and allied industries certainly will intensify the problem of obtaining an adequate supply of skilled workmen. Farsighted executives were warning industry of this impending shortage as long ago as 1932, yet many companies have done little to anticipate or prepare for it. Apparently English employers have been more forehanded. Judging from Mr. Stilwell's observations, many of them have gone to great lengths to train young men for skilled occupations in the metalworking trades. He witnessed plants in which among hundreds of machine operators he saw few who seemed to be over 40 years of age.

American Employers Should Heed Lesson of England in Problem of Training Workmen

Possibly if many American employers could see at first hand the results of effective training in English machinery establishments, and if they could be made to realize the imminence of an embarrassing shortage in the United States, they would start immediately to devote idle plant space and equipment to the instruction of young men in the operation of machines. Appreciation of the seriousness of the situation would dictate formation of comprehensive training plans.

Judging from the prominence of headlines in American newspapers relating to the possibility of war abroad, one might think that the outstanding lesson to be learned from Europe today is "Be prepared for war." However, to the thinking American industrial executive who wants to improve the potential earning power of his company, the more important lesson is "Be prepared for real economic recovery when it arrives."

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries declined 6.3 points to 92.4 in the week ending August 15:*

Week ending	1936	1935	1934	1933
May 30	98.6	71.9	75.7	65.3
June 6	98.8	79.3	82.3	69.9
June 13	99.4	80.0	83.6	72.1
June 20	101.0	77.3	81.8	73.9
June 27	101.9	78.4	79.4	77.0
July 4	97.5	64.1	52.3	71.4
July 11	100.9	76.5	67.8	79.1
July 18	99.9	79.8	68.1	79.4
July 25	102.1	80.8	66.4	78.8
Aug. 1	102.5	78.4	64.8	75.9
Aug. 8	98.7†	73.4	64.6	74.7
Aug. 15	92.4*	77.5	61.4	74.2

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL*). Average for 1926 equals 100, weighted as follows: steel rate 40, and car loadings, power output and auto assemblies each 20.*

Widespread Activity Offsets Decline in Auto Output

WHILE STEEL's index of activity for the week ending Aug. 15 shows a rather sharp decline, due entirely to a precipitous drop in automobile production, the outlook for a continuance of activity at high levels throughout a broad sector of industry remains bright.

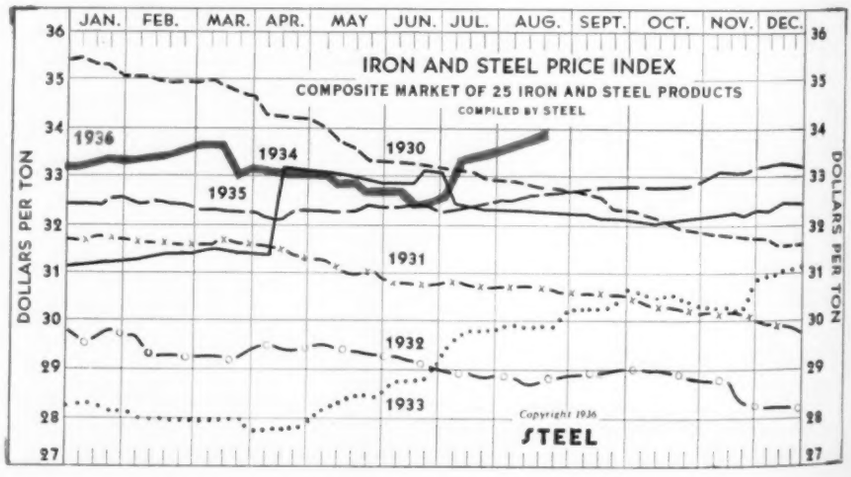
The effect of the belated changeover season in motordom is more than offset by an accelerated tempo in other branches of industry. Orders for machine tools are mounting steadily. New bookings for foundry equipment are up, according to the latest report. The rate of steelworks operations, while holding steady in the week ending Aug. 15, again was tending upward in the week ending Aug. 22.

Revenue freight traffic was up slightly in the second week of August and electric power output—which had remained stationary in the preceding week—mounted to 2,093,928,000 kilowatt hours in the week ending Aug. 15. This came within a narrow margin of establishing a new all-time record.

Concurrently the daily average production of crude oil touched the highest point in the history of the petroleum industry. Figures for building construction are the best since the low point of the depression.

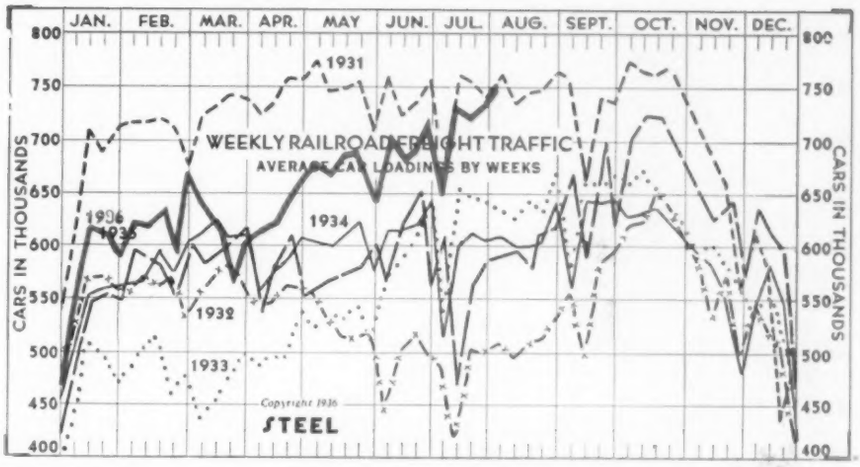
Combined with these favorable indicators are increasing signs of a stronger price situation in many commodities, which may supply a stimulating influence to demand in the remaining months of the year.

	1936	1935	1934
Aug. 15	$33.88	$32.68	$32.23
Aug. 8	33.82	32.64	32.23
Aug. 1	33.72	32.59	32.28
July 25	33.51	32.55	32.28
July 18	33.49	32.42	32.28
July 11	33.48	32.40	32.33
July 3	33.48	32.39	32.38
June 27	32.79	32.39	33.15
June 20	32.77	32.40	33.16
June 13	32.77	32.41	32.84
June 6	32.81	32.45	32.83
May 30	32.83	32.43	32.81
May 23	32.87	32.41	32.89
May 16	32.94	32.34	32.94



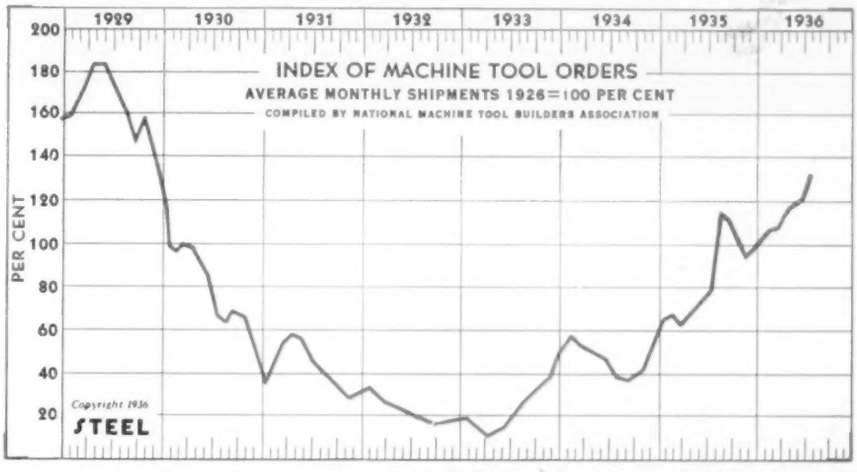
Freight Car Traffic Holds to High Levels

	1936	1935	1934
Aug. 8	728,293	583,743	602,530
Aug. 1	747,551	597,083	611,298
July 25	731,062	596,462	608,800
July 18	720,402	593,366	614,900
July 11	724,324	566,488	602,800
July 4	649,759	472,421	519,800
June 27	713,639	618,036	644,600
June 20	690,716	567,847	621,900
June 13	686,812	653,092	617,600
June 6	695,845	630,836	615,600
May 30	646,859	565,342	578,500
May 23	683,406	598,396	625,990
May 16	681,447	582,950	612,331



Machine Tool Orders Still Mount Steadily

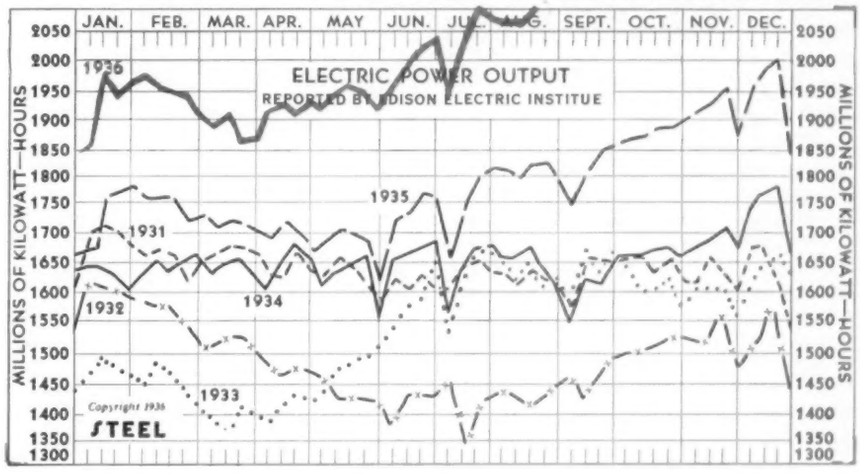
	1936	1935	1934	1933
Jan.	102.6	61.3	56.5	18.3
Feb.	107.1	61.5	58.2	15.2
March	109.4	60.3	50.9	11.1
April	114.4	60.3	48.5	8.3
May	116.6	67.1	46.8	10.6
June	124.5	76.7	42.6	15.5
July	132.6	94.7	38.6	22.4
Aug.	.....	112.2	37.1	27.9
Sept.	.....	108.5	37.4	30.9
Oct.	.....	102.9	40.5	33.3
Nov.	.....	93.8	44.2	38.0
Dec.	.....	99.9	54.1	51.0


1929 1930 1931 1932 1933 1934 1935 1936
INDEX OF MACHINE TOOL ORDERS
AVERAGE MONTHLY SHIPMENTS 1926=100 PER CENT
COMPILED BY NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
PER CENT
Copyright 1936
STEEL

Electric Power Output Again Near Record

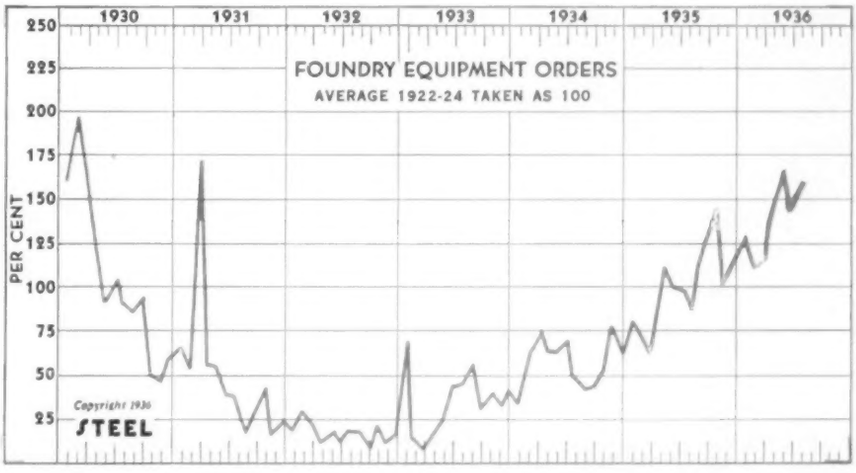
Millions Kw.-Hrs.

	1936	1935	1934	1933
Aug. 15	2094	1832	1674	1650
Aug. 8	2079	1819	1659	1627
Aug. 1	2079	1821	1657	1650
July 25	2008	1823	1683	1661
July 18	2099	1807	1663	1654
July 11	2029	1766	1647	1648
July 4	1940	1655	1555	1538
June 27	2029	1772	1688	1655
June 20	2005	1774	1674	1598
June 13	1989	1742	1665	1578
June 6	1945	1724	1654	1541
May 30	1922	1628	1575	1461
May 23	1954	1696	1654	1493
May 16	1961	1700	1649	1483



Foundry Equipment Orders Rebound in July

	Per Cent			
	1936	1935	1934	1933
Jan.	127.0	86.6	37.2	68.4
Feb.	110.4	75.7	65.8	16.1
March	115.0	69.4	75.4	9.8
April	134.0	113.2	67.9	19.4
May	165.4	100.7	66.5	25.6
June	141.4	100.2	70.4	45.5
July	159.6	94.0	50.7	48.8
Aug.	.....	113.0	43.1	56.3
Sept.	.....	128.5	46.4	34.9
Oct.	.....	140.0	55.3	42.5
Nov.	.....	100.4	80.4	36.6
Dec.	.....	118.1	66.9	43.8



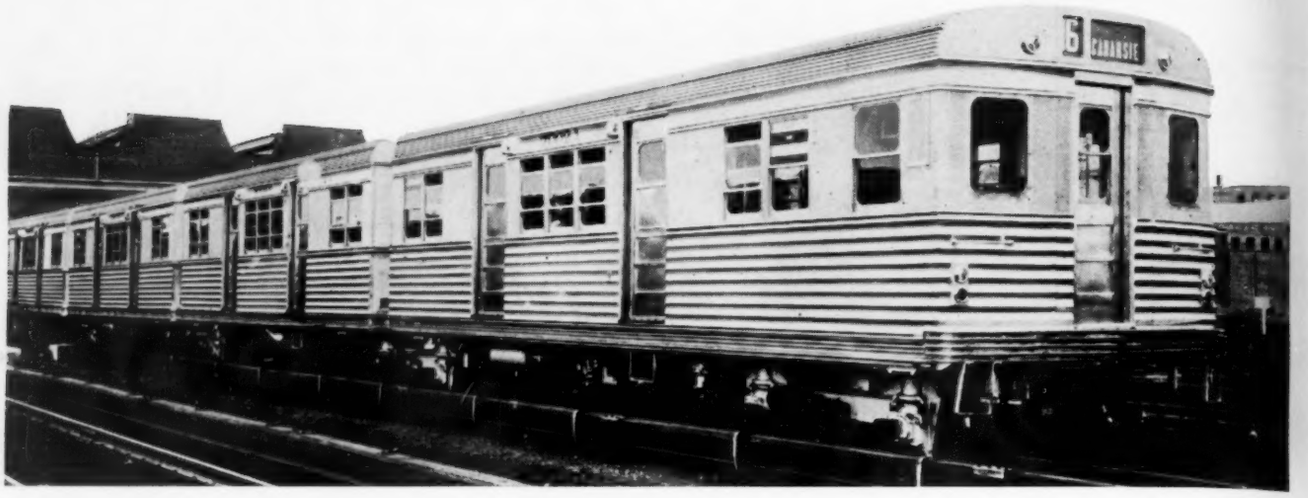


Fig. 1—Multisection subway-elevated car of shotwelded stainless steel construction, equipped with welded steel truck frames, bolsters and spring planks

Welded Alloy Steel Plate Used for

IN 1934, two experimental five-section articulated subway-elevated cars were built for the Brooklyn-Manhattan Transit Corp. lines, New York. They were designed to speed local service almost to express schedule by quicker acceleration and deceleration, without making necessary any reinforcement of the existing elevated structure. Fig. 1 shows one of these multi-section cars (STEEL, July 16, 1934), constructed by the Edward G. Budd Mfg. Co., Philadelphia, using "shot-weld" stainless steel construction, and weighing substantially less than comparable cars of conventional design.

As a means of contributing to the weight reduction of the multi-section car, welded steel truck frames, bolsters and spring planks, fabricated by Lukenweld Inc., division of Lukens Steel Co., Coatesville, Pa., were used on the Budd-built unit placed in service in July, 1934.

Fig. 2 shows one of the welded steel truck frames, fabricated from cromansil steel. It was made up of 78 separate pieces of varying sizes and shapes, integrated by welding. The flange metal was 9/16-inch in thickness, and the webs in general were 5/16-inch plate. The method of carrying the journal reaction into the frame proper, and the method of producing the journal box guides from a single formed plate are clearly shown in the illustration. This frame, one of six produced for the train, weighed approximately 1500 pounds before machining.

Fig. 3 shows one of the welded steel bolsters, also fabricated entirely from cromansil steel. This structure weighed 340 pounds before machining. Fig. 4 shows one of the welded steel spring planks of cromansil steel

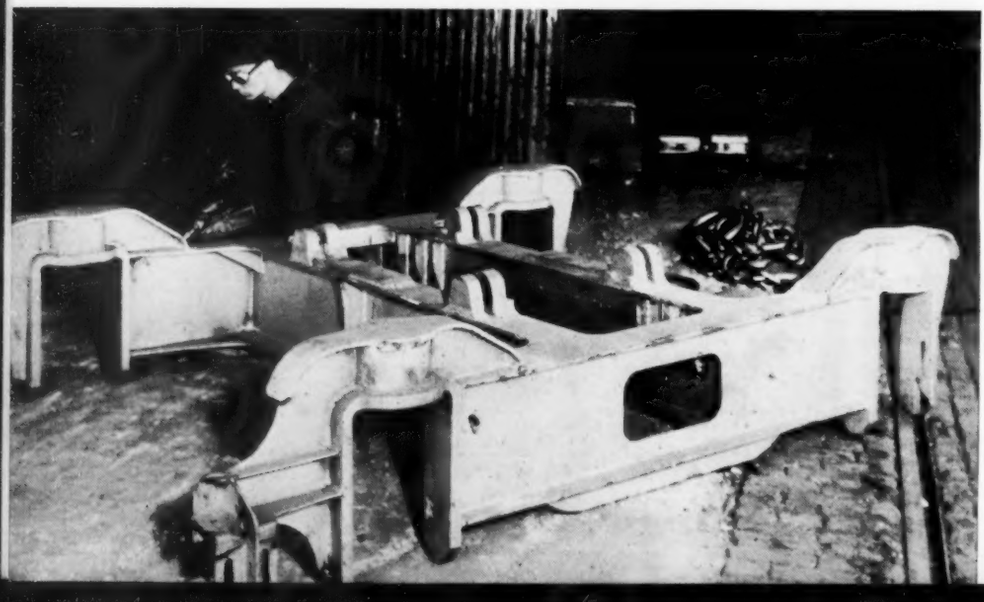


Fig. 2—Closeup of truck frame used on the cars, made up of 78 separate pieces and weighing about 1500 pounds before machining

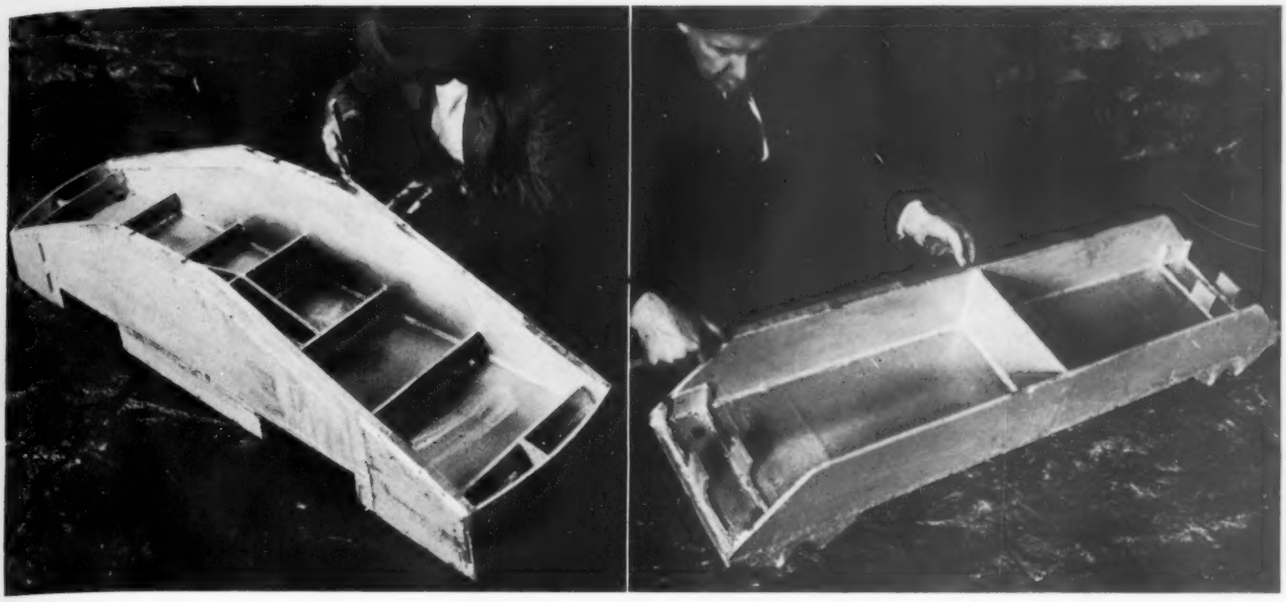


Fig. 3 (left)—Bolster of welded steel plate, weighing 340 pounds before machining. Fig. 4 (right)—Spring plank of similar construction, weighing 200 pounds

Subway Car Truck Frames, Bolsters

for the same multi-section car, which weighed 200 pounds as shipped from the weldery.

As a result of the experience gained in the operation of the two experimental trains, the B. M. T. Lines recently ordered 25 five-car articulated units. Ten units were purchased from the St. Louis Car Co., St. Louis.

In considering the type of truck frame, bolster and spring plank for these units, a number of designs were studied. One design, in pressed steel and castings integrated by riveting, showed fairly favorable weight, but was estimated to be 4000 pounds heavier per train than the welded design. This 4000-pound saving possible through the welded design—comprising two thirds of the total weight variation permitted in the building of the units—was obviously highly desirable not only from the standpoint of power saving in train operation, reduced wear and maintenance on wheels, track and other elements, but also because it would eliminate the necessity of making other reductions in the weight of the car structure which might reduce its collision strength.

St. Louis Car Co., therefore proposed and the B. M. T. Lines accepted welded steel construction for the truck frames, bolsters and spring planks. The welded truck frames are composed of pressed plate members of cromansil steel, generally ¼-inch thick, and electric furnace castings of cromansil analysis.

Due to the greater quantity of duplicate units involved compared to the six frames, bolsters and spring planks required for the original Budd-built experimental train, an entirely different design viewpoint was necessary from the production angle. Introduction of formed plate sections became economically attractive. It was also considered advisable to apply the swing link bearings

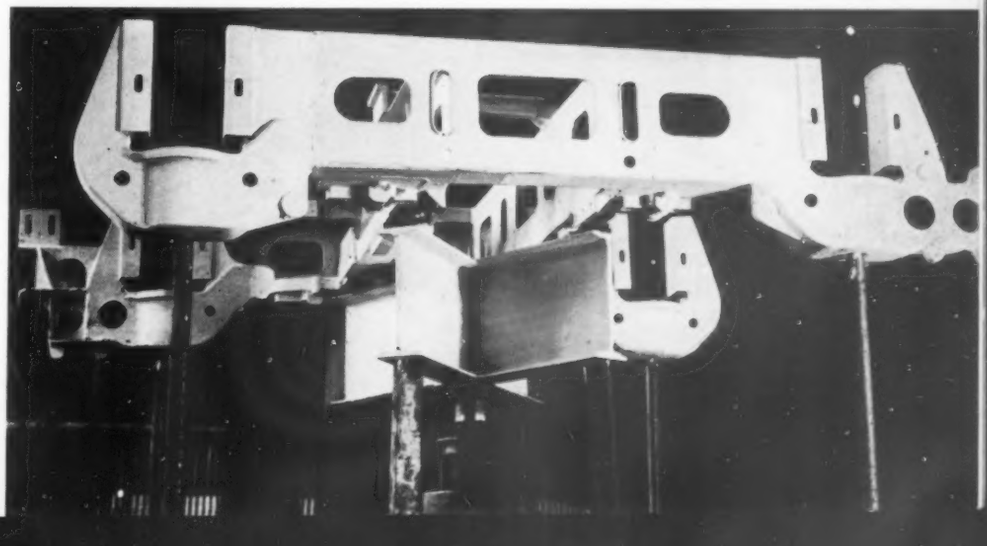


Fig. 5—Setup for destruction test on truck frame, with load applied at center through X-shaped member and hydraulic jack

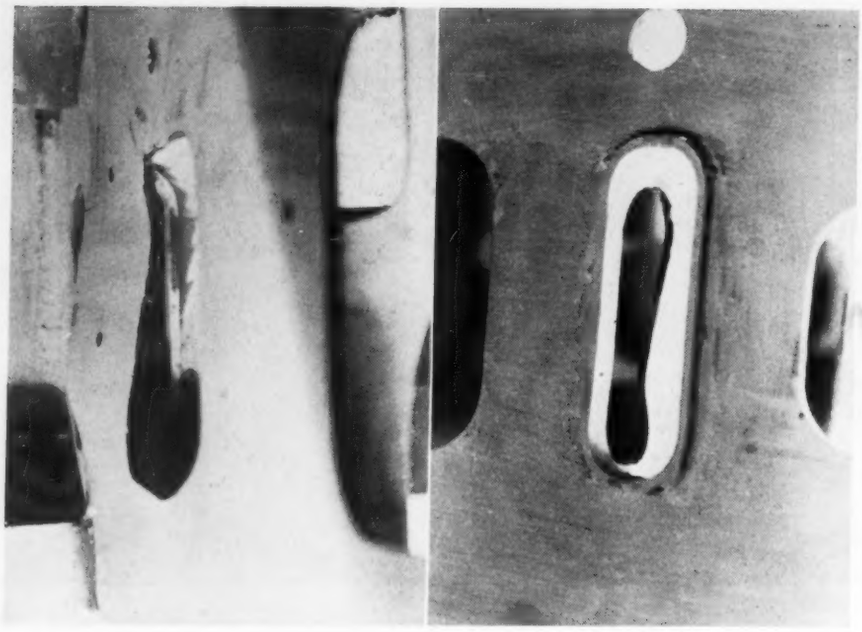


Fig. 6 (left)—Closeup of edge of web which buckled in destruction test. Crippling appears to be a pure column failure. Fig. 7 (right)—Another view of crippled web after destruction test

(which had been built into the original six frames) at the final assembly of the truck. Small pads, machined to take the bearing blocks welded on at the final assembly, welded to the top flange of the transom members, eliminated the drilling and boring operation which would have been relatively costly if done on the completed frames.

Consideration of contours at the intersection of formed sections, plus the small details incidental to the support of brake rigging at these points, dictated use of steel castings in the corners where the transom intersects the side members.

Single Shoe Brakes Used

In the new design of welded truck, an important change was the introduction of single shoe brakes. The two brake cylinders were located at the extreme ends of the truck, diagonally opposite. The small details, the box section necessary to resist lateral stresses set up by cylinder reactions, and the quantities involved, combined to indicate the desirability of cast steel pedestals. These castings are butt-welded to the ¼-inch formed side member sections, at points immediately behind the inner journal box guides. Due to their complicated nature, the thinnest metal section that could be obtained, consonant with sound castings, was ⅜-inch.

At a center plate loading of 34,000 pounds, the design stress in these trucks is approximately 24,000 pounds per square inch, which is about 40 per cent of the endurance limit of the base material, as shown by rotating beam tests. The experimental truck frame was found adequate for this design stress and as an additional precaution, all fillets were carefully ground and considerable effort was expended in eliminating abrupt changes in contour.

Cromansil steel, in a 0.17 per cent carbon grade, shows a yield strength of about 62,000 pounds per square inch, an ultimate strength of 95,000 pounds per square inch, and an elongation in 8 inches of 26 per cent. The carbon content is purposely limited to 0.17 because of the damage to the higher carbon steels through the welding heat, and while these trucks are thoroughly heat treated after welding, it is possible that at some future date minor repairs or additions might be necessary on the trucks and the low carbon content of the steel assures completion of any such repairs with minimum hazard.

Minimum Weight Essential

While the design stress of 24,000 pounds per square inch may seem to be high, it is the sum of the stresses due to all possible loads that might occur at the same time. Several units of welded railroad equipment have given successful service over a period of years working at this stress.

In cromansil steel and at the working stress of 24,000 pounds per square inch, the total weight of two pilot trucks, four articulated trucks, six bolsters and six spring planks is 10,710 pounds per 127,000-pound train, which gives an average weight per truck of 1785 pounds including spring plank and bolster.

Absolute minimum weight was essential in the trucks of these trains, due to the fact that they are to be placed in local service in which express schedule time must be maintained, and the accelerations and decelerations on local service are frequent. Therefore the inertia of the train must be as low as is consistent with long service life and safety requirements.

In view of the fact that the webs of the trucks were rather completely

(*Please turn to Page* 58)

Fig. 8—Part of a shipment of welded steel spring planks, each weighing 80 pounds, for use in the new subway cars

Venetian Blinds of Steel— Adjustable in Width, Finished Before Forming

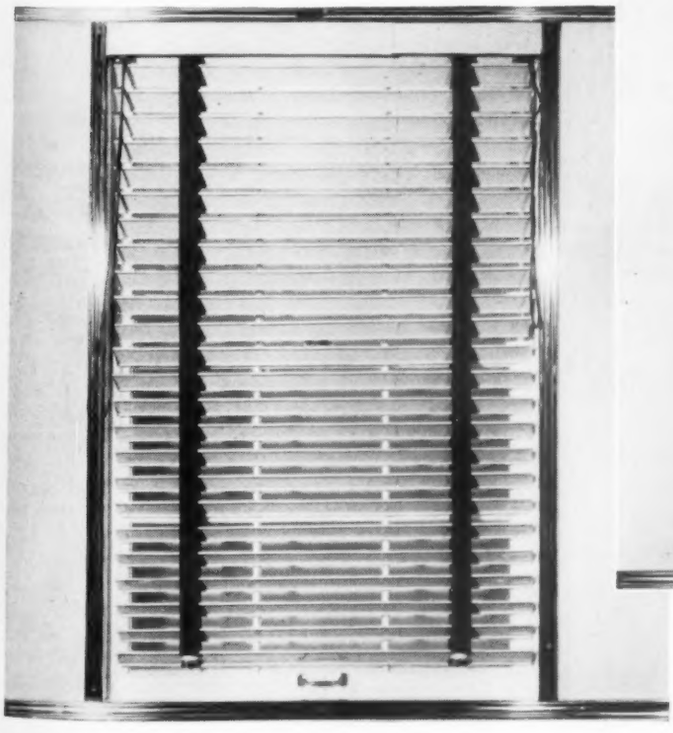
BY R. L. HARTFORD
Editorial Representative

ONE of the final touches adding distinction to the beauty of modern homes and offices is the use of Venetian blinds. In a great many cases, use of these blinds has been curtailed because of their evident disadvantages—tendency of the wood slats to warp in wet weather, difficulty of cleaning, fire danger, high cost and inflexibility. These difficulties have been overcome to a large extent in a new blind now being introduced by the Bettcher Mfg. Corp., Cleveland. After a period of development extending over three years, the company has perfected a Venetian blind fabricated from steel. The material used in construction of these blinds is a 32-gage prefinished lacquered stock, which is finished in any desired color before being fabricated. Supplied by the Weirton Steel Co., Weirton, W. Va., the steel is coated with a flexible lacquer by a roller coating process and baked on at the Weirton plant, being furnished in standard sheet sizes.

The slats are pressed in two pieces, each a fraction over 20 inches long, which fit one inside the other. This telescopic feature gives the steel blind its greatest advantage over the other type blinds, since it makes the new product completely flexible and permits it to be used on any window or door from 26 to 40 inches. Savings in many ways are evident through the use of this feature. The blind at its smallest size, 26 inches, weighs approximately 2 pounds more than a wood blind of equal size, and at its widest is considerably lighter than the equivalent blind of the older type. The small size steel blind is made to sell at the same price as a wooden blind, and of course price does not scale up in comparison to size as in the nonadjustable blinds. This feature also allows the blinds to be moved from one window to another of different size if desired.

Edges of the slats are formed into a bead in a three-operation process on a standard press. Slots are punched to allow for the control cords, and the edges of these slots are turned over in order to prevent the steel from causing the cords to wear. There is less friction in this type blind than in the conventional type, making for smoother operation.

High gloss finishing on this steel sheet not only makes a better appearance in the reflection of light, but also makes the blinds easier to clean. The flexibility of the finish, which allows the pieces to be stamped



ADJUSTABLE width venetian blinds of 32-gage steel are furnished in many colors. Above is shown a blind partially raised, and at left a blind is extended, showing the bead on the edges of slats

and formed without cracking, offers a high resistance to wear. Rustproof and fireproof, the blinds are available in a wide range of fast colors, which will not turn dull from exposure to sunlight.

Standard "ladder" type cloth tapes are used in the construction of the blinds, and hardware is standard throughout. Tilting mechanism which is housed in the headpiece, is of worm and gear type. Headpiece is also built on the telescope principle and adjusts with the slats. Since the whole assembly is of light weight construction, weights are provided on the bottom piece to insure better balance. In addition to the adjustable blinds, custom models built to fixed specifications are available.

Wire Association Releases Program

SIX technical sessions, a business meeting and an informal dinner will comprise the program for the annual convention of the Wire association to be held at Hotel Cleveland, Cleveland, Oct. 19-22, in connection with the eighteenth annual National Metal congress and exposition.

A wide range of subjects related to the manufacture and treatment of wire will be considered at the technical sessions. Among these topics are: Cleaning, heat treating, material handling, springs, welding wire, research, cold working of metal, testing copper wire, power cable, and dies and tools.

Monday morning, Oct. 19, will be devoted to registration and an informal get-together; during the early afternoon the board of directors and program committee will hold meetings. Later in the afternoon the association will conduct its annual business meeting.

The Wire association medal will be awarded at an informal dinner to be served at the Mayfair Casino on Wednesday evening, Oct. 21.

The tentative program, listing papers and speakers, has been announced as follows:

Monday, Oct. 19

MORNING

Registration.

AFTERNOON

Board of directors meeting.
Annual meeting.

Tuesday, Oct. 20

MORNING

Cleaning—Heat Treating—Material Handling

"Cleaning Houses in the Wire Industry," by A. F. Anjeskey, sales manager, Cleveland Tramrail division, Cleveland Crane & Engineering Co., Wickliffe, O.
"Atmosphere Furnaces in the Wire Industry," by H. M. Heyn, engineer in charge of heat treating division, Surface Combustion Corp., Toledo, O.

AFTERNOON

Springs—Welding Wire

"Materials for Springs," by J. W. Rockefeller Jr., consulting engineer, New York.
"Welding Wire," by R. Notvest, chief engineer, welding division, J. D. Adams Co., Indianapolis.

Wednesday, Oct. 21

MORNING

Research

"Research as Applied to Manufacturing," by C. W. Meyers, development engineer, American Steel & Wire Co., Cleveland.
"Wire Research by the United States Army," by Capt. Frank W. Bullock, signal corps, United States army.
Motion picture—"Signal Communication Within the Infantry Regiment."

AFTERNOON

Cold Working of Metal

"Plastic Deformation in Wire Drawing," by B. L. McCarthy, metallurgist, Wickwire Spencer Steel Co., Buffalo.

EVENING

Informal dinner at Mayfair Casino.
Award of Wire association metal.

Thursday, Oct. 22

MORNING

Testing Copper Wire—Power Cable

"Fatigue Properties of Copper Wire," by J. N. Kenyon, testing engineer, department of civil engineering, Columbia university, New York.
"Vacuum Lead Sheath as Applied to Power Cable," by R. W. Atkinson, research laboratory, General Cable Corp., Perth Amboy, N. J.
Motion picture—"Tactical Employment of the Antiaircraft Artillery Regiment."

AFTERNOON

Dies and Tools

"Tungsten Carbide," by A. R. Zapp, manager, Firthaloy division, Firth-Sterling Steel Co., McKeesport, Pa.
"A Suggested Method of Handling Tungsten Carbide Dies Within the Die Room," by K. R. Beardslee, general sales manager, Carboloy Co. Inc., Detroit.

Gear Makers Association Arranges Meeting Program

American Gear Manufacturers association has announced the program of papers to be presented at its nineteenth semiannual meeting, Sept. 8-10. This meeting will be held on board the S. S. SEEANDBEE, sailing from Chicago, Tuesday morning, Sept. 8, and arriving in Cleveland, Thursday evening, Sept. 10.

The program will include an address by President E. S. Sawtelle, vice president and general manager, Tool Steel Gear & Pinion Co., Cincinnati, and the following papers:

"Things to Think About," by J. H. Jackson, Pittsburgh Gear & Machine Co., Pittsburgh.
"Designing High-Speed Gears for Quiet Operation," by W. P. Schmitter, Falk Corp., Milwaukee.
"Plant Management," by W. G. Jones, W. A. Jones Foundry & Machine Co., Chicago.
"Recent Developments in Bevel and Hypoid Gearing," by A. H. Candee, Gleason Works, Rochester, N. Y.
"Relations Between Load Rating and Design Stresses," by C. B. Connell, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Metals and Minerals To Be Exhibited in New York

American Institute of Mining and Metallurgical Engineers, in co-operation with Metal Products Exhibits Inc., International building at Rockefeller Center, New York, has assembled an interesting and instructive exhibition which reveals the metallic elements present in the earth's crust, their availability, locations of commercial sources and the flow of metals and minerals in world trade.

Genuine ores, metals, and typical fabricated metal products, including specimens and displays supplied by state and federal agencies, as well as the major metal producing companies, are shown.

This special exhibit, to be shown from Aug. 17 to Oct. 17, will be open every week day from 10 a. m. to 6 p. m., except Saturday when the closing hour is 3 p. m.

Short Course in Castings

Metal Castings, by Harry L. Campbell, M. S., formerly associate professor of metal processing, college of engineering, University of Michigan, Ann Arbor, Mich.; cloth, 318 pages; published by John Wiley & Sons Inc.; supplied by STEEL, Cleveland, for $3.15; in Europe by the Penton Publishing Co. Ltd., Caxton House, Westminster, London.

According to the foreword the textbook has been prepared to assist in the organized study of materials and processes employed in production of metal castings. The reasons for the selection of materials and the procedure used in the manufacturing processes are explained. Special consideration is given to the constitution, properties and classification of cast ferrous and nonferrous alloys. Relationship of design to the production of metal castings constitutes an important division.

A bibliography following each chapter furnishes reference for readers who desire additional information. Each chapter also is followed by a series of review questions. Tabulated data, standard specifications for cast metals and foundry control methods are presented in the concluding pages. A four-page cross index covers the subject matter. The book is well illustrated, and while the various points are covered briefly, the presentation is sufficiently explanatory for students and others who desire a general, rather than a minutely specialized description of every factor involved in the production of castings.

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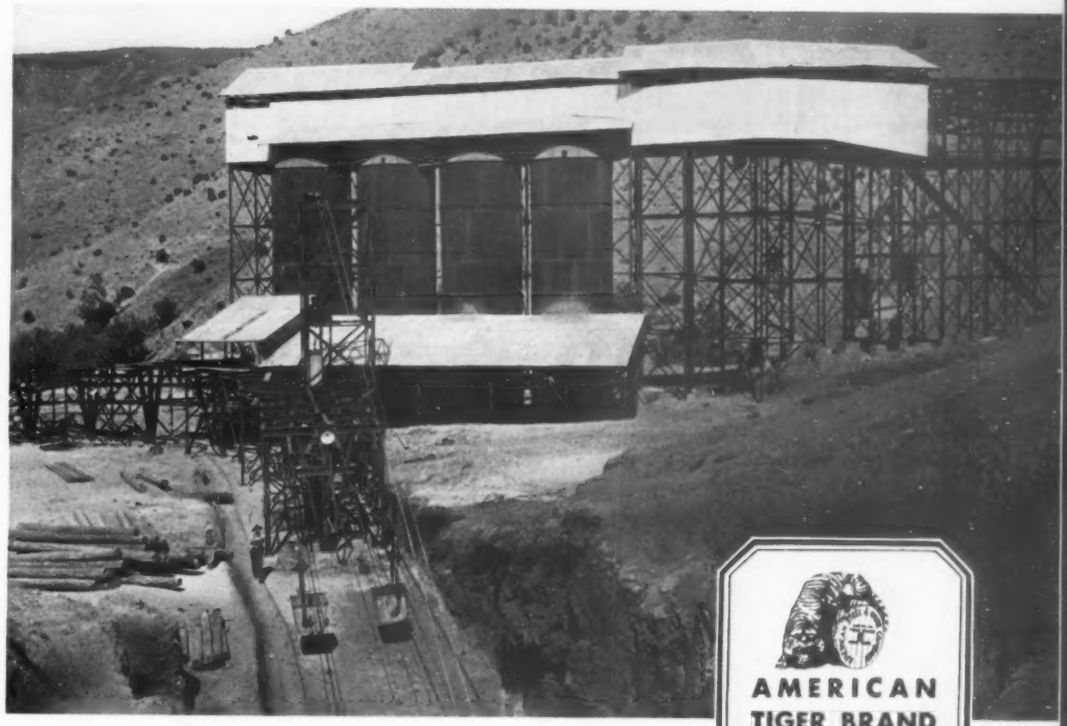

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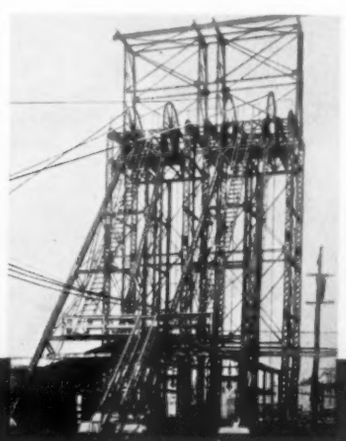

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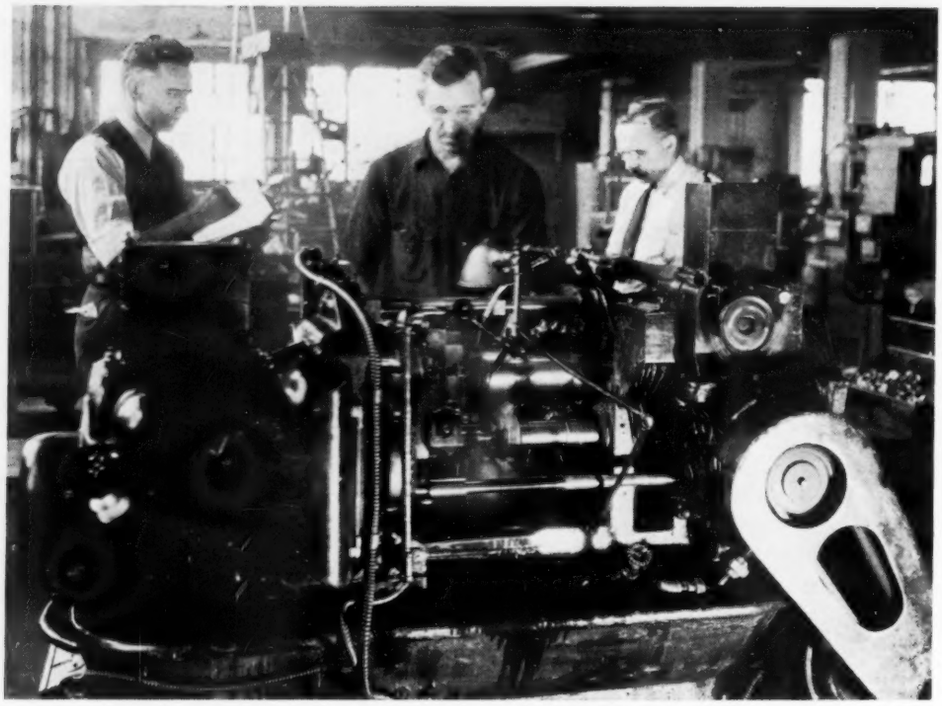


Boosting operating speeds of machines to answer the demand for greater production places more importance on the problem of selecting suitable materials for moving parts

TAKE A LOOK AT MATERIALS

Change in Selection or Treatment May Provide Ready Answer to Problems of Altered Product

BY N. B. MACLAREN
Experimental Engineer, Brown & Sharpe Mfg. Co.
Providence, R. I.

EVER-increasing demand for more production is being expressed by users of machine tools. Designers, aware of this, are constantly planning new designs or changes to the present basic machines. Since in most cases this demand means speeding up operations, concentrated effort is made to speed up without changing basic design.

To innovate and complete an entirely new design is often a lengthy procedure, and likely to be expensive. No doubt the problem may be answered by new designs. This means, however, new drawings, new patterns, new dies, new tooling equipment, new methods of scheduling and many other revisions. It also makes obsolete the present tooling equipment.

In many cases the problem may be answered and effective results obtained by giving careful study to the materials used. For instance, suppose the speeding up the machine with its present clutches will cause their breakage or will create excessive wear. Possibly a change in material or heat treatment will overcome this. The speeding up of a spindle may cause overheating and subsequent seizure. Perhaps a change in bearings, a change in method of lubrication, or a change in spindle material may prevent this, and so on. Numerous other cases could be cited where increased speeds and pressures create damage to respective parts of the machine.

When such conditions arise, it is a good plan to study the materials used in the design, and also to study means of increasing strength by carefully considering heat treatment. New materials with greater physical strengths frequently will offer a solution to the problem.

However, even if new materials are the answer, in many cases unforeseen obstacles arise. The machinability question creates impatience. We frequently hear such statements: "That sample lot of three spindles machined well. Why don't these 100 machine as well? The tools burn—a smooth cut cannot be obtained—duplicate sizing is difficult to obtain, etc. Why so much distortion and 'soft skin' on this lot of 100 clutches?" Such problems are aftermaths and have to be worked out gradually in practice, and recorded thus as experience for future reference.

At Brown & Sharpe, problems of this nature are frequently occurring, and the purpose of this article is to point to one or two cases where so-

lutions were obtained not by expensive changes but by careful revision of material and heat treatment.

The automatic screw machine has probably kept the designer as active as any machine in the machine tool industry. The advent of free-cutting screw steel and high-sulphur screw steel necessitated increasing spindle speeds and clutch movements. These changes created new conditions such as increased impact, increased fatigue, increased wear and the like.

Fig. 1 is a sketch of a conventional screw machine reversing spindle clutch lever. The tolerances of this part are close. It is important that the bearing points be in correct relation with the hole. These

Fig. 1—Proper selection of steel for this screw machine clutch lever aided in production of a long-wearing part

and the wear value has been greatly improved.

Machinability presented some trouble. Careful study of cutters, cutting lubricants, and structure of the steel was necessary. Having determined the best structure of steel, a specification was set up and placed in the hands of the steel manufacturer. In purchasing or ordering the

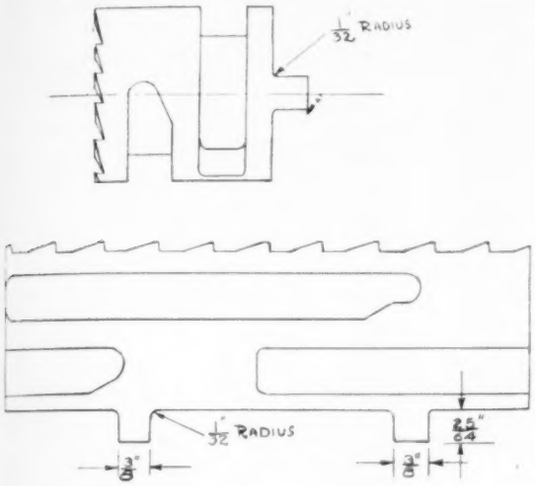


FIG. 2—Details of screw machine clutch on which change of steel was necessary because of peening on cam path and occasional breaking of lugs

points and the sides of the hole are exposed to heavy pressures.

When these parts were made from an oil-quenching chrome-nickel steel, the hole was made 0.002-inch large in the soft condition. After hardening, the hole would shrink slightly more than 0.002-inch. Little lapping would be required. When it became necessary to change this material, a chrome-nickel case hardening grade of steel was selected. Extensive wear tests proved this material to be decidedly superior. Leaving the hole 0.002-inch large as in oil-hardening grade of steel did not give consistent uniformity after hardening. Possible variations in the steel or variations occurring during the long carburizing period were plausible reasons for such inconsistency. The hardness produced made lapping difficult and expensive. Tendency was for the hole to shrink. To overcome this condition the hole was made standard and the stock caused by the shrinkage in carburizing was reamed to standard size before final hardening. Final heating was done in cyanide and quenching in brine. The surface produced is extremely hard, a deep case to support the heavy pressures is obtained

steel, reference is made to this specification. The steel mill uses every precaution to duplicate hardness and structure.

The screw machine clutch shown in Fig. 2 is another interesting problem. Here again it was necessary to change material. The cam paths, due to the action of the trip lever, commenced to peen over. The lugs under continual impact would sometimes break at the fillets. Selective drawing of the lug to create toughness was difficult and expensive, the difficulty being that the heat would creep back to the cam path and create softness. The clutch teeth have to be hard to prevent peening and sufficiently tough to prevent breaking. To change the design of these clutches would have involved countless other changes in adjacent or neighboring parts.

Several steels were selected for this application, each one having possible merits. Analysis and catalog data were the basis for selection. To test all these steels, which numbered over 15, would have required several hundred hours, not to mention the time involved to make the clutches of the different materials. The following procedure was adopted:

As the clutch is exposed to impact and peening, the best combination of satisfactory toughness and best peening resistance should give the desired results. A clutch was selected on which lugs were sufficiently tough. An impact sample such as shown Fig. 3 was made of this same material. The lugs of the impact sample approximated the dimensions of the clutch lugs. The heat treatment of the impact sample was such as to give the same hardness of the clutch lug.

Drop Weight Tester Used

This impact sample was then tested in a drop weight impact testing machine. This machine consists of a 10-pound weight which is permitted to drop at intervals of 6 inches. The total energy recorded on this "accepted toughness sample" was 1000 inch pounds. The hardness, however, was approximately 60 Scleroscope which was entirely too soft to withstand peening.

Knowing the impact of 1000 inch pounds to be satisfactory, it was then necessary to find a steel with at least this impact but with a higher Scleroscope reading. In fact, it was previously determined that a clutch with a reading under 70 would not satisfactorily withstand the peening to which the part would be subjected.

Impact samples were made from all the steels selected for test. All samples were milled alike and all were hardened at recommended heats and drawn at various temperatures. Impacts were made at dif-

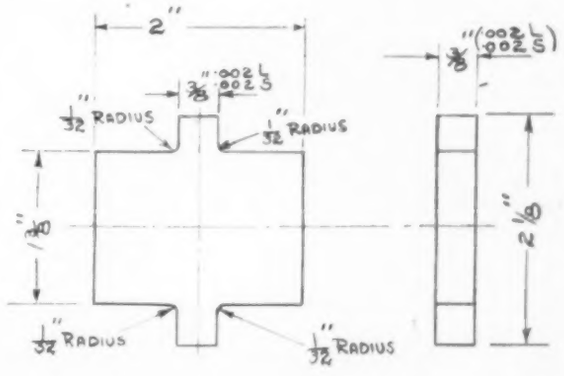


FIG. 3—Sketch of impact sample, lugs on which approximate dimensions of clutch lugs used on the machine

Summary of Impact Results and Peening Tests

No.	Analysis, per cent C	Ni	Cr	Mn	Mo	Si	Impact, In.-lbs.	Peening value	Hardness Sclero-scope	Rock-well C
20	0.65	.....	.....	0.90	0.80	.....	2000	0.0114	78	56
22	0.50	1.75	1.10	.....	.....	.....	1720	0.0155	74	55
13	0.45	1.25	0.60	.....	.....	.....	1305	0.019	72	58
24	0.50	.....	.....	.....	0.50	1.00	2030	0.013	76	58

ferent drawing temperatures, and all steels having impacts under 1000 inch pounds and hardness under 70 Scleroscope were eliminated. The accompanying table is a summary of the four steels which survived the tests, giving the chemical composition, impact results and peening values.

Any of the steels shown here would be satisfactory in respect to toughness. Choice in this respect would depend on machinability, cost of material and heat treatment. It was felt, however, that considerable variation in peening would result.

To determine this effect the broken impact samples were used. Sharp corners were ground and the samples inclined at an angle of approximately 45 degrees. A hardened steel hammer, operated mechanically, was allowed to drop on this sharp edge for a definite time. The flat produced was a measure of peening, the wider the flat the less resistance to peening.

The steel selected for satisfactory toughness and best resistance to peening was a medium-carbon, high-molybdenum steel, No. 20. Since this material was adopted, practically no trouble has been experienced with these clutches as applied to the machines.

As in the case cited previously, the machinability of the clutches was solved by experimenting with various heat treatments. The best structure for chucking, turning, gear cutting and other operations, was determined and a specification was formed and placed in the hands of the steel manufacturer.

These two cases are cited to illustrate how the increasing demands of the machine were answered by change in material with the least possible expense.

New Copper Alloy Being Used in Welding Tips

Said to combine the physical properties of steel and bronze with the high electrical and heat conductivity of copper, a new alloy known as Hackett K-copper is being marketed by Hackett Brass Foundry, Detroit. With hardness of 125 to 150 brinell, ultimate strength of 70,000 pounds per square inch, elongation of about 20 per cent, and reduction of area of 50 per cent, it is available in bars, forgings and castings, and is being used by its producer in the manufacture of a wide range of standard and special spot welding tips. No information is given as to composition of the new copper alloy.

"Clinics" To Show Practice In Nonferrous Welding

Latest developments in welding practice for nonferrous alloys will be demonstrated at two "clinics" to be held in Cleveland and Buffalo, N. Y., during September. Included will be practical examples and demonstrations of the latest methods of electric and oxyacetylene welding and brazing on Monel, aluminum, nickel copper, brass, bronze, inconel, and nickel-clad steel.

The "clinic" at Cleveland will be conducted by welding engineers of the International Nickel Co., the Aluminum Co. of America, and the Revere Copper & Brass Co. It will be held in the warehouse of Williams & Co. Inc., 1748 East Twenty-second street, Sept. 18 and 19.

At Buffalo, the clinic will be held Sept. 25 and 26 in the warehouse of Whitehead Metal Products Co. of New York Inc., 254 Court street. It will be under auspices of International Nickel, Aluminum company and the American Brass Co.

Somewhat similar clinics have been planned for Montreal and Toronto in October.

Results of Tests on Steel Wind Bents Are Published

Bulletin 93 of the engineering experiment station, Ohio State university, Columbus, O., has recently been published, entitled *Tests and Design of Steel Wind Bents for Tall Buildings.* This publication has been prepared by George E. Large, Samuel T. Carpenter and Clyde L. Morris in co-operation with the American Institute of Steel Construction. The testing work has been carried on using a Spurr-designed steel model 55-story, 3-panel symmetrical bent. The lower 13 stories were reproduced, the upper 42 stories being simulated by a steel rigging. The model bent was tested lying flat upon steel tables with the base anchored to a concrete pier, the wind loads being applied by dead weights operating over pulleys. The Spurr method was verified by the investigators before actual tests on the model began. Results are set forth in a 15-point summary.

Steel Cabinets for Hospital Supplies

CABINETS storing equipment in the workroom for nurses in the Allegheny general hospital, Pittsburgh, are entirely of steel. Ledges and workshelves are of stainless steel, and the cabinets are finished in dull gray enamel with chromium plated pulls and hinges. Shelves in the storage section are adjustable to any height. Equipment was furnished by the Globe-Wernicke Co., Cincinnati

Welding, etc. . . .

by Robert E. Kinkead

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

Unpredictable, Unknowable

THERE are matters involved in the behavior of metal under stress which would seem to fall within the bounds of common knowledge, about which we have little information. The physical behavior of metal under certain circumstances seems to be governed by the laws of probability rather than by laws in text-books.

The case of large rolls used by the steel industry illustrates the field of uncertainty involved in metal behavior. Of 25 rolls made by methods as nearly identical as possible with present controls, one roll may break apart before it ever goes into service and another may fail prematurely in service, but all the remaining rolls will give long service with no ruptures. Since discontinuities are seldom involved, the problem seems to be one of residual stresses. There are some indications that the critical condition in which three-dimensional stresses are of equal value is responsible. It does not now lie within the field of things practicable to predict when this critical condition will occur.

In the field of fusion welding, the degree of residual stress, its direction or type is unpredictable and in many cases unknowable. Thermal or mechanical stress relieving are practical and successful treatments for an undesirable condition, the details of which are unknown.

Penalty of Secrecy

A WELL-KNOWN manufacturer of extruded arc welding electrodes invites the trade to inspect his plant and be convinced that a wire coating plant is something more than the rear end of a garage and a wash-tub. Such a move probably marks the end of secrecy in the coating of welding rod. It was only a few years ago that the operation of coating welding rods was carried out by relatives of the owner of the business or employes bound by contracts signed in blood by which they were never to disclose the secrets of the method.

Coating welding rod is a highly specialized business which has been developed by patient research. The results have far exceeded expectations in reference to the quality of weld metal deposited. In the case of welding ordinary steel, the weld is actually better metal than the pieces joined. The processors who coat welding rod add economic value of several hundred dollars a ton to the steel wire they coat for use as welding rod.

The penalty of secrecy is always the creation of new competition. A man will believe almost anything about a secret process and will beg, borrow, or steal the money to enter a field about which he knows practically nothing. Lifting the veil of secrecy from coating welding rod will do much to stabilize the industry.

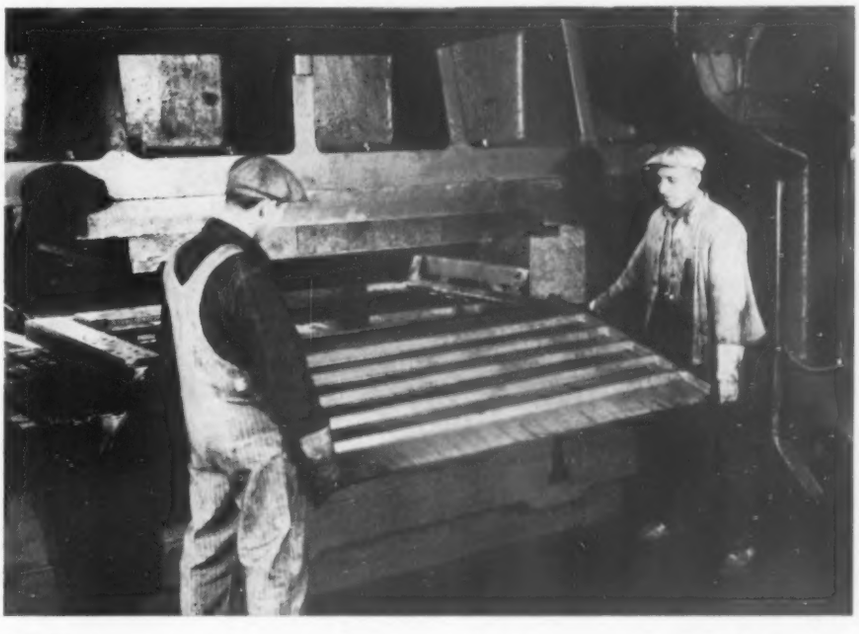
Statistical Estimates

CURRENT estimates indicate welding rod consumption for gas and electric arc welding is running at the rate of about 110,000,000 pounds for 1936, as compared with 83,000,000 pounds for 1935.

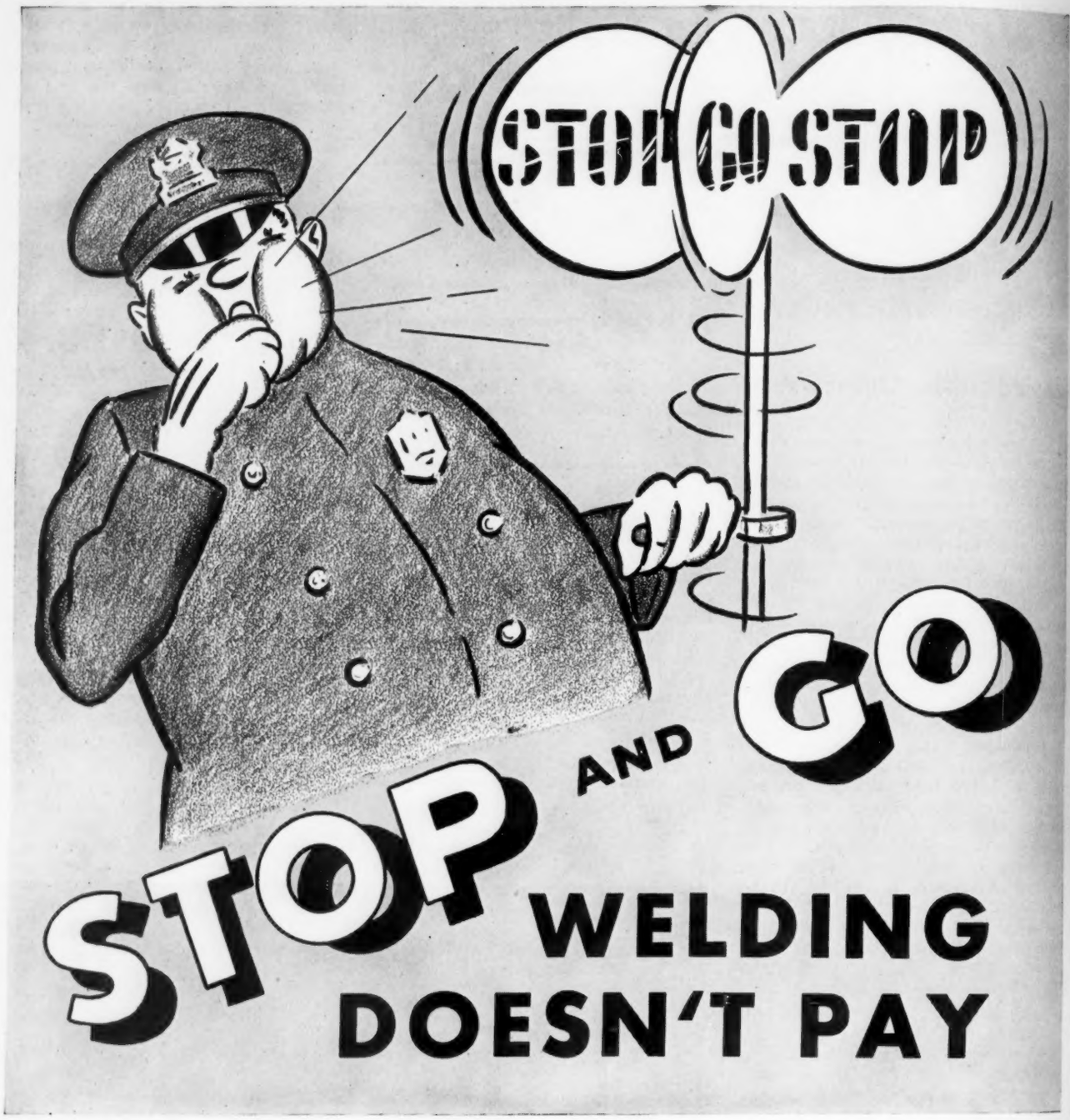
A figure of 2½ pounds per hour represents a fair average rate of consumption per man engaged exclusively in welding. This means that in a year's employment an operator will consume about 5000 pounds of welding rod. At an average value of 9 cents per pound, this amounts to $450 worth per man per year.

The above figures indicate that about 22,000 men are employed in welding at the present time. However, such an estimate does not take into account the nature of a great deal of maintenance and production welding in which the operator does fitting up and other work. It is probable that more than 45,000 men are rated and paid as welding operators. The payroll is pretty close to $60,000,000 per year.

Low-Alloy Steel for Doors



SAVING a reported 300 pounds per car, these boxcar doors are of Yoloy, low-alloy high-tensile nickel-copper steel produced by the Youngstown Sheet & Tube Co., Youngstown, O., and are manufactured by Youngstown Steel Door Co. It was discovered that the tight hard scale present on sheets of this material does not crack when the sharper angles are formed. Door panels having a three-way draw at the end of each corrugation involved minimum springback, according to the manufacturer



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Single, automatic current control, stabilized arc, uniform current — these advantages are all the carefully calculated result of the highly refined, precision construction of the P & H-Hansen — the welding generator that is the universal choice of the experienced welders.

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Notes On Fluxes for Hot Galvanizing

BY A. T. BALDWIN

Chemical Engineer, Hanson-Van Winkle-Munning Co., Matawan, N. J.

Part II

THIS is the second and concluding installment of an article on galvanizing practice, the first installment of which appeared in STEEL *for Aug. 17 and covered present practice in a general way, pointing out various weaknesses and methods of correcting them*

SO FAR these notes have been an attempt to present a rational basis of comparison of various chemical compounds used as fluxers. In line with the premise, the final decision about the proper flux to use will be made based on how one wants to galvanize and how interested the galvanizer is in cost and quality of workmanship. If a higher quality of galvanizing, with regard to coating adherence and ductility, is of consequence, then the complete elimination of the use of hydrochloric acid and sal ammoniac is clearly indicated by experience. Developing or improving other features of the entire galvanizing process may show quality improvements but the results generally appear disappointing and uncertain unless these changes also include the elimination of the conventional hydrochloric acid and sal ammoniac reagents.

Since the employment of zinc ammonium chloride as a flux wash is recommended primarily to retard or prevent oxidation of the thoroughly pickled and rinsed work, some discussion of such a flux wash is in order. In 1934 two United States patents[1] were issued covering the use of certain frothing agents with various fluxing chemicals including zinc ammonium chloride, on the preparation of fluxes and on the use of such prepared mixtures as flux washes. These patents cover inventions made during several years of study of the flux problem and the continuous extension of the use of the flux known as No. 20 and the flux wash process associated with it amply confirm the correctness of it all in accomplishing the retardation of oxidation of pickled and rinsed work.

Chemical literature contains frequent discussions concerning the manufacture and use of zinc ammonium chloride. P. A. Meerburg[2] published a complete study of the system "Zinc Chloride-Ammonium Chloride and Water," in which it is shown that there are two definite crystalline compounds which can be called zinc ammonium chloride and a whole galaxy of mixtures appearing as solid phases on crystallization.

One of these zinc ammonium chloride compounds contains theoretically 56.04 per cent zinc chloride and 43.96 per cent ammonium chloride combined in the ratio of 1 molecule of zinc chloride and 2 molecules of ammonium chloride. The other of these compounds consists theoretically of 45.94 per cent zinc chloride and 54.06 per cent ammonium chloride combined in the ratio of one molecule of zinc chloride to 3 molecules of ammonium chloride.

Purity and Uniformity High

This second type is the one the writer has in mind when the term zinc ammonium chloride is used in these notes. It is preferred not only because it is less hygroscopic than the other but also because its higher ammonium chloride content contributes to greater satisfaction in use. As chemical manufacturing processes go this type is fairly simple to produce, of great purity, and high uniformity.

It may be of interest to note here that to a limited extent some galvanizers treat their exhausted flux skimmings with water and attempt to use these leachings as a flux wash. Almost invariably these leachings will contain zinc chloride and ammonium chloride present in the molecular ratio of 1:1; that is, there will be approximately 71.8 parts of zinc chloride found for every 28.2 parts of ammonium chloride present in the leachings. This water soluble part of the spent flux is in reality the unconsumed residue of the original flux, the balance being the infusible and insoluble complex zinc oxy-compounds. In practice these leachings perform about on a par with zinc chloride as a flux wash. Replacing them with zinc ammonium chloride leads to galvanized coatings with greater adherence and ductility.

It is also interesting to note the 1:1 molecular ratio of zinc chloride to ammonium chloride which con-

[1] United States patent 1,965,759; A. T. Baldwin and Hanson-Van Winkle-Munning Co. United States patent 1,965,760; A. T. Baldwin and Hanson-Van Winkle-Munning Co.

[2] *"The System Zinc Chloride-Ammonium Chloride-Water,"* by P. A. Meerburg. Zeitschrift fur Anorganische Chemie, Vol. 37, page 199, 1903.

firms conclusions reached otherwise that such a ratio is the most stable one for these two compounds at the temperature of the zinc kettle and leads to the belief that this more tightly bound ammonium chloride is not readily available for such cleansing work as must be done in the flux box. Also it supports the recommendation of frequent removal by skimming of the hard, infusible, totally exhausted flux; thus giving this fluid, more stable fusion a better chance to function properly.

Preparation of Flux Washes

Zinc ammonium chloride flux washes are made by dissolving the proper weight of the salt in cold water. An all-wood tank is to be preferred but if this is not available then a lead lined steel tank may be used. If the flux wash is to be heated, lead pipe should be used. Since the flux wash is in reality an electrolyte, corrosion between pipe and fittings or along weld seams will soon start with iron pipe and result in contamination and operating inconveniences. No attempt should be made to heat the flux wash by use of an open steam line because of the difficulty in maintaining a uniform concentration of the flux wash, a desirable feature. The accompanying table gives data on zinc ammonium flux wash densities and composition.

Dissolving zinc ammonium chloride in water yields a solution of larger volume than that of the water used. This effect increases as the concentration of the zinc ammonium chloride increases. It is hardly noticeable below 10 degrees Baume, at 20 degrees Baume the volume increases between 20 and 25 per cent and at about 30 degrees Baume the volume is increased about 50 per cent. This means, therefore, if 3.26 pounds of zinc ammonium chloride is dissolved in one gallon of water at 20 degrees Cent. (68 degrees Fahr.) the resulting solution will not read 21.4 degrees Baume (see table) because there will be almost 1¼ gallons of liquid containing 3.26 pounds of the salt and the hydrometer will read more nearly 17 degrees Baume. On the other hand if 3.26 pounds of the salt is dissolved in 0.8 gallon of water the result will be about 1 gallon of a flux wash reading about 21.4 degrees Baume.

Effect of Frothing Agents

Protection of the pickled and rinsed work being the most important duty of the flux wash, it is essential that the flux wash be held at a fairly constant composition so that the film formed as the work is removed from the flux wash tank will be as uniform as possible. The effect of water being introduced into the flux tank by the rinsed work, of flux wash removed on the work and of evaporation can be controlled simply. The proper solution level on the side of the flux tank should be marked and the desired flux wash strength established by experience and these two standards should be maintained by additions once daily or at less frequent intervals as operating conditions indicate just so that the concentration does not vary more than about 1 degree Baume total range.

The use of a flux base such as zinc ammonium chloride, to which has been added a suitable frothing agent, serves several useful purposes in a flux wash and on the zinc kettle. Care at this point[3] yields a flux wash of zinc ammonium chloride in water of reduced surface tension and increased viscosity which assures better wetting of the surface of the work and gives a flux film of better protecting characteristics more economically. Since such a film contains some fairly stable colloids, it fuses to a light froth when the work enters the molten zinc and this froth leaves the work quickly and cleanly to result in less flux being dragged through onto the finished work. This condition is especially noticeable on work having inner, more or less inaccessible surfaces, such as pipe.

May Be Used Hot or Cold

A zinc ammonium chloride flux wash may be used either hot or cold, the decision being based on the speed of the operation as it effects the exposure of the flux coated work to the air before entering the zinc kettle. The object of using a heated flux wash is to cause sufficient evaporation of the water in the flux film on the work to keep any water explosions at a harmless minimum when the work is placed in the molten zinc. This same end can be reached by using a cold flux bath and drying the work moderately and carefully before placing it in the zinc kettle. This latter method should be carefully supervised, however, because of the greater danger of overdrying and removing all moisture from the flux film and thus causing some undesirable oxidation of the iron or steel.

The same feature applies to the selection of the temperature to be used in a heated flux wash. More highly concentrated flux washes can be heated to a higher temperature for equal protection. Rinsed work needs to remain in the flux wash tank merely long enough to be thoroughly wet all over. Remaining in the flux wash is not harmful.

Many Advantages Gained

The use of zinc ammonium chloride crystals already mixed with a suitable frothing agent has many advantages besides the selection of the best flux base, the zinc ammonium chloride. Uniformity of the fused flux froth not only aids in production speed but also in proper flux action at all times on all surfaces of the work. A flux froth of proper height for preheating the entering work, for leaving the entering work quickly and cleanly and for most effective chemical action is maintained most economically this way. Experience indicates that such flux mixtures are from 15 to 20 per cent more effective than zinc ammonium chloride alone. New fluxes are built in the same manner as with sal ammoniac and additions are made in the same manner as required. Annoyance from fumes is reduced appreciably, thereby affording better working conditions.

The consistency of the fused flux is controlled largely by the frequency of additions of new flux crystals. The amount of flux being supplied as the film on the entering work also contributes to this control. The constant supply of an appreciable part of the total flux required in the form of this flux film tends to maintain the fusion in a more active state so that there is no difficulty in maintaining a suitable froth. The only field of galvanizing where this operating condition is not maintained so readily is that one where the operation is irregular and intermittent so that the destructive effect of heat on the idle flux froth causes premature exhaustion. So far no flux has

[3] United States patent 1,965,760, July 10, 1934; A. T. Baldwin and Hanson-Van Winkle-Munning Co.

Zinc Ammonium Chloride Density Data at 20 Degrees Cent.

Grams salt in 100 c.c. water	Degrees Baume	Specific gravity	Per cent salt by weight	Weight per gal., lbs.	Weight of salt in one gal. solution, lbs.
10	7.45	1.052	9.09	8.76	0.79
20	11.8	1.088	16.67	9.06	1.51
30	15.5	1.120	23.08	9.34	2.16
40	18.7	1.148	28.55	9.57	2.73
50	21.4	1.173	33.33	9.78	3.26
60	23.6	1.194	37.50	9.95	3.73
70	25.9	1.217	41.17	10.15	4.18
80	27.8	1.237	44.45	10.3	4.57
90	29.6	1.272	47.40	10.48	4.96
100	31.0	1.280	50.00	10.62	5.31

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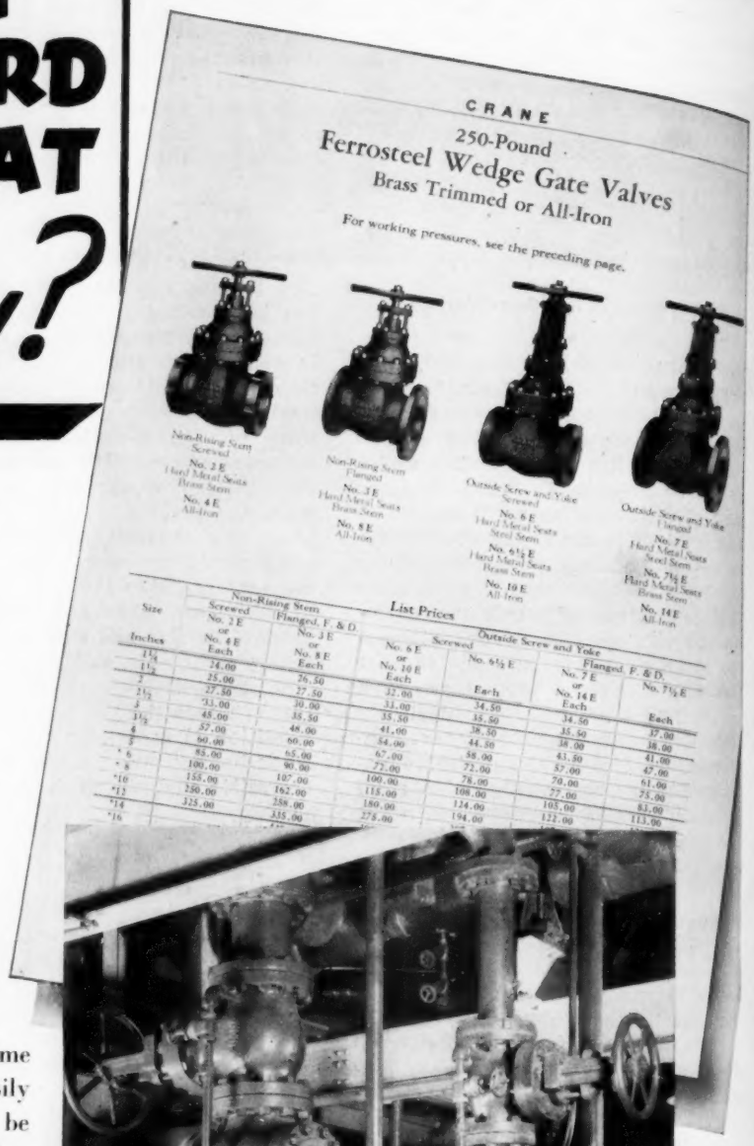
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250-Pound

Ferrosteel Wedge Gate Valves

Brass Trimmed or All-Iron

For working pressures, see the preceding page.

Non-Rising Stem Screwed — No. 2 E Hard Metal Seats Brass Stem — No. 4 E All-Iron

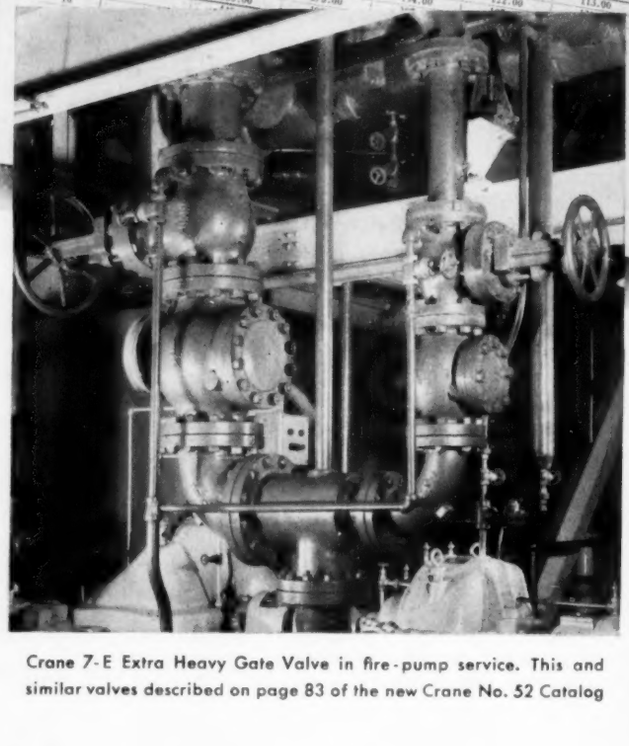
Non-Rising Stem Flanged — No. 3 E Hard Metal Seats Brass Stem — No. 8 E All-Iron

Outside Screw and Yoke Screwed — No. 6 E Hard Metal Seats Steel Stem — No. 6½ E Hard Metal Seats Brass Stem — No. 10 E All-Iron

Outside Screw and Yoke Flanged — No. 7 E Hard Metal Seats Steel Stem — No. 7½ E Hard Metal Seats Brass Stem — No. 14 E All-Iron

List Prices

Size	Non-Rising Stem Screwed No. 2 E or No. 4 E Each	Non-Rising Stem Flanged, F. & D. No. 3 E or No. 8 E Each	Outside Screw and Yoke Screwed No. 6 E or No. 10 E Each	Outside Screw and Yoke Screwed No. 6½ E Each	Outside Screw and Yoke Flanged, F. & D. No. 7 E or No. 14 E Each	Outside Screw and Yoke Flanged, F. & D. No. 7½ E Each
Inches						
1¼	24.00					
1½	25.00	26.50	27.50	34.50	34.50	37.00
2	27.50	27.50	32.00	35.50	35.50	38.00
2½	53.00	30.00	31.00	38.50	38.00	41.00
3	45.00	35.50	35.50	44.50	43.50	47.00
3½	57.00	48.00	41.00	58.00	57.00	61.00
4	60.00	60.00	54.00	72.00	70.00	75.00
5	85.00	65.00	67.00	78.00	77.00	83.00
*6	100.00	90.00	77.00	108.00	105.00	113.00
*8	155.00	107.00	100.00	124.00	122.00	132.00
*10	250.00	162.00	115.00	194.00		
*12	325.00	188.00	180.00	275.00		
*14		335.00				
*16						



Crane 7-E Extra Heavy Gate Valve in fire-pump service. This and similar valves described on page 83 of the new Crane No. 52 Catalog

FOR 250-pound steam lines and high-pressure water, oil, gas and air lines in iron and steel plants, Crane No. 7-E Ferrosteel Wedge Gate Valves are exceptionally serviceable. They are rugged and substantial.

The stamina of the 7-E is assured by bodies and bonnets of Crane Ferrosteel, which has a tensile strength approximately 35 per cent greater than cast iron. Amply proportioning these parts lends great strength and rigidity. All other parts are also made extra strong to insure long life. The valve seats and discs, for example, are of Crane Hard Metal to resist wear, wire-drawing and corrosion.

Only minimum maintenance is required because the valves remain tight for a long time and lubrication and repacking may be done easily and quickly. Sizes of 6-inch and larger can be supplied with a by-pass to warm up the piping before the main valve is open in the case of steam, or to equalize the pressure in the case of fluids and gases.

The careful design and the stamina of this valve is typical of Crane valves and fittings for all requirements of the iron and steel industry. The Crane branch or distributor in your city can serve you.

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been developed that survives such treatment.

The selection of a proper strength of zinc ammonium chloride flux wash is influenced not only by the type of work being done but also by the handling methods such as batch sizes and time of exposure in air. It also should be at the highest concentration which these factors permit in order to allow the flux film to supply the largest proportion possible of the total flux requirements. This leads to economy in flux use. It is difficult to control the actions of the men at the kettle whose natural tendency seems to be wasteful in the use of flux crystals. Detail differences in galvanizing the same products in different plants lead to rather wide differences in the strength of flux wash required and the total flux used.

Broadly speaking, wire calls for flux washes from 5 to 12 degrees Baume either hot or cold; fabricated wire products about 15 degrees Baume; castings and fittings 10 to 15 degrees Baume; drums, barrels and boilers 12 to 17 degrees Baume; sheets 10 to 15 degrees Baume; pipe 18 to 22 degrees Baume; heavy castings and tanks 20 to 25 degrees Baume. These figures are for hydrometer readings at room temperatures. As already indicated, whether the zinc ammonium chloride flux wash must be heated depends on local conditions and may be heated without loss of anything but water up to 212 degrees Fahr.

Some few operations are carried out most satisfactorily by heating the work AFTER it leaves the flux wash and this, if done in closed ovens away from air, may be carried out safely to temperatures above the fusion point of the flux. The flux film on the entering work may provide all the flux required or as little as 25 per cent of the total depending on the product and how it is handled.

Changeover Made Readily

Generally speaking, the total amount of a zinc ammonium chloride flux used seldom exceeds the amount of sal ammoniac used for the same work by the hydrochloric acid-sal ammoniac system. When galvanizers change from the old method to zinc ammonium chloride, experience soon leads to the use of a smaller amount of zinc ammonium chloride flux.

Products galvanized with the use of a zinc ammonium chloride flux carried out with due regard for the important operating features have smooth, adherent, ductile zinc coats. Products galvanized this way form more readily, with little or no cracking of the coats. While a rather severe test, exposure to a sand blast of products galvanized this way shows a pounding and flattening effect rather than the typical shattering of coats put on by the use of hydrochloric acid and sal ammoniac. Tempered steel is readily galvanized by the zinc ammonium chloride flux method without loss or temper. The replacement of the hydrochloric acid-sal ammoniac method by a zinc ammonium chloride flux wash and kettle flux does not require expensive additional equipment.

In conclusion it may be said that the galvanizer's choice of a flux and fluxing system will be influenced largely by the extent of his desire to produce high quality work at a minimum cost. These notes point out the directions galvanizing must follow to accomplish this and point definitely to the use of a properly prepared zinc ammonium chloride flux wash and kettle flux. While to many, with long experience in galvanizing, these suggestions may seem of doubtful practicability, in fact, they are all now well tried and proved. The change required in most shops to take advantage of the merits of zinc ammonium chloride is more of the nature of a change of point of view of the operator than of extensive and expensive changes in equipment and operating details. Modern demands for quality in galvanizing have moved so far forward that the old method of finishing the pickling in the fused flux itself is no longer adequate.

Salt Spray Test Defended by Government Metallurgists

Detection of improper surface finish on stainless steel bars intended to stand up under outdoor exposure is credited to the "salt spray" test by metallurgists of the national bureau of standards, Washington, in a recent announcement.

This so-called "salt spray" test is widely used for stainless steel, the bureau's experts explain, and yet it is often criticized as a basis for predicting the behavior of these alloys under general service conditions.

Some of this criticism, it was stated, is probably justified, but, nevertheless, the test may be useful for showing whether or not the surface of the material has been finished in such a way as to insure the maximum corrosion resistance of which it is capable.

Recently several bars of cold-rolled chromium-iron alloy (13 per cent chromium), with surfaces ground smooth and bright, were exposed in a mist of a 20 per cent sodium chloride solution for 24 hours. Numerous rust spots originating at isolated places over the surfaces of the bars resulted. However, after a refinishing of the bars, during which a layer approximately 0.01-inch thick was removed from all surfaces, no pitting or rusting whatsoever was observed when the bars were exposed to the same testing conditions.

As this material was intended for outdoor exposure at an inland location, it was evident, in the opinion of the bureau's experts, that the resistance to corrosion inherent in the material would not have been obtained with the original surface finish.

A.S.T.M. Committees Report Corrosion Data

The following papers and discussions presented at the thirty-ninth annual meeting of the American Society for Testing Materials, held at Atlantic City, N. J., June 29-July 3, will be of interest to those concerned with the finishing and corrosion protection of metal:

1936 Preprint 77—"The Testing of Organic Finishes," by A. E. Schuh, Bell Telephone Laboratories Inc., New York.

Methods of testing organic finishes are described wherein their physical characteristics, such as distensibility, impact resistance, and abrasion resistance are quantitatively measured. When these tests are performed under conditions of controlled temperature and humidity upon specimens of controlled thickness, a method of accelerated testing is provided. The operation of the several tests is described and demonstrated. The significance of the tests in terms of finish serviceability is discussed.

1936 Preprint 18—*Report of Committee B-6 on Die-Cast Metals and Alloys.*

Appendix II of this report, "Finishing of Die Castings," by J. C. Fox, Doehler Die Casting Co., Toledo, O., covers the progress made to date in the finishing of zinc-base and aluminum-base die castings with both organic and electroplated finishes. Cleaning procedures, plating baths, chemical treatments and other pertinent data are specified.

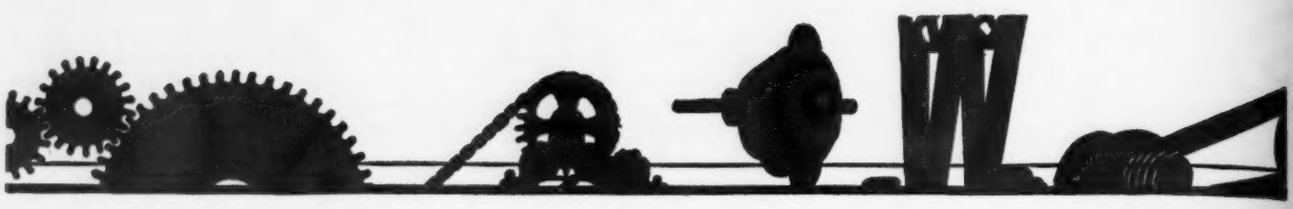
1936 Preprint 62—*Report of Committee D-1 on Preservative Coatings for Structural Steel.*

A tabulated report of the activities of the subcommittees assigned to the various projects. Test methods, specifications and other data are referred to only by A.S.T.M. designation. No detailed reports are given. Methods of analysis, accelerated tests and definitions are among the subjects covered.

1936 Preprint 11—*Report of Committee A-5 on Corrosion of Iron and Steel.*

Results of the outdoor corrosion tests of copper-bearing and non-copper-bearing bessemer and open-hearth steel, puddled iron, galvanized wire and other materials are reported in tabular form. A tentative method of testing galvanized wire for uniformity of coating is also proposed.

Power Drives



Speed Reducer Loads

IN DETERMINING the power requirements of speed reducers it is necessary to begin calculations at the ultimate load of the driven equipment and work backward to the prime mover. Theoretically the same horsepower must be delivered by the prime mover as is required to operate the driven unit. Actually the prime mover must be increased to compensate for efficiency losses in the reduction unit. Also, to the theoretical load of the driven unit must be added the efficiency losses of the driven machine.

Unless these losses are taken into account both prime mover and reducer may be under-size for the requirements. For example, a worm reducer is to be applied to a conveyor drive. Assuming that the theoretical conveyor load is 10 horsepower and that the conveyor operates at 80 per cent efficiency the actual load of the conveyor is 12½ horsepower.

Speed reducer manufacturers usually include the efficiency losses of the reducer in computing the output torque or power delivered. Users, therefore, when selecting the speed reducer from the manufacturer's tabulated data are sometimes misled into choosing the lowest priced speed reducer suitable for the installation although a more efficient reducer would permit using a smaller motor with a continuous saving in power consumption. For example, on this conveyor drive an old type worm reducer with an efficiency of 50 per cent would require a 25 horsepower motor while a modern type reducer would operate more satisfactorily with a 15 horsepower motor. Thus, one type of drive would consume 66 2/3 per cent more power than the other and both do the same work.

The increased investment in the speed reducer is balanced by decreased motor cost and a continuous saving in power costs. With the wide variety of types and ratings of speed reducers available to the user, computations on the cost installed and operating costs, including power and annual fixed charges of the entire drive installation should show the most profitable type of unit for the work.

• • •

Overload—Less Output

IN an attempt to rush production on a battery of grinding machines finishing the edge of a steel plate after cutting by torch the speed of the automatic feeds was increased. As a result the motors, which were mounted on the machine with a short-center belt drive, became sluggish and seriously overheated.

Investigation showed that to prevent slippage an abnormal belt tension was required. The excessive bearing pressure alone added considerable load to the motor and with the increased feed was more than the motors could stand.

As an experiment the speed of the automatic feed was reduced to normal and the tension on the belt eased. As a result the actual production was slightly increased and all motor trouble eliminated.

Both motors and machines have load limits and neither can be overloaded continuously without experiencing trouble either in the equipment or in quality and output.

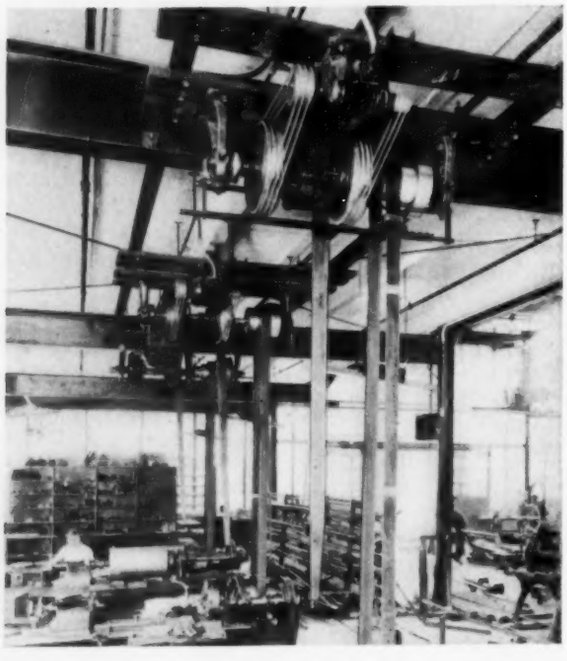
• • •

For safety when applying stick or brushing other belt dressing near a pulley, apply to the outgoing side of the belt so that the travel of the belt will tend to throw the hands away from the pulley instead of into it. Using sticks in holders or brushes with handles is another wise safety precaution.

• • •

The least expensive lubricant is the one which, when properly applied, results in the lowest cost for maintenance and the least interruption to service.

Number of Speeds on Lathes Doubled



IN MANY shops lathes are seldom used for cutting threads and so have little need for the reverse drive in the countershaft. In the plant of the Schmuts Mfg. Co., Louisville, Ky., individual motors with extended shafts and two diameters of V-belt sheaves double the drive speeds obtainable with the step-cone pulleys and back-gears. Here the work varies from large printing press cylinders to small diameter shafts and the increased number of speeds obtainable permits selection of the most suitable speed for each diameter or material. Start and stop buttons are mounted on the belt shifters within convenient reach. Allen-Bradley Co., Milwaukee, furnished the control equipment

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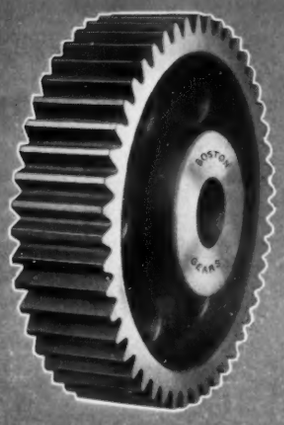

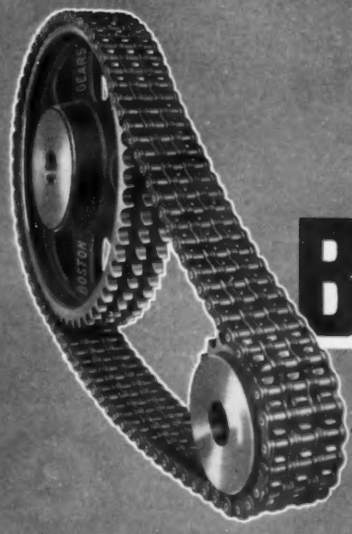

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Progress in Steelmaking

Detects Elements in Iron

A new "eyeglass", which enables the human eye to surpass some of the marvels of the electric eye, has been developed. With this "eyeglass" the human eye now is able to see impurities in metals which previously have required hours to detect. In addition, it empowers the human eye to measure the impurities down to quantities of five millionths of a gram, despite the fact that this mere speck is scattered throughout the material under inspection. The new device, known as a spectrophotometer, recognizes metallic impurities by their color. It looks like a small telescope, bent at one end in order to see around a corner. In it the human eye compares a known color with that of an unknown substance. The substances under examination are dissolved in acids or other solutions so that their colors can be seen by light passing through the glass container. One of the wonders of the new eyeglass is the detection of titanium in iron. Both metals, dissolved, give a yellow color. But even when there is 4000 times as much iron present as titanium, the eyeglass revealed the titanium and measured its amount by a slight difference in the shade of yellow. In another case an impurity had found its way into a large batch of commercial mercury. Titanium was suspected. The eyeglass showed no titanium but revealed molybdenum from a water supply was the contaminating element. Both titanium and zirconium have been detected down to five millionths of a gram.

• • •

Copper Slabs Are Employed

A laminated copper mold stool has been placed in service in the open-hearth shop of a large eastern steelmaker. The stool, which receives a 27,000-pound ingot, is made of copper slabs, 4 x 10 inches. These are held securely in a cast iron frame by heavy springs. Inspection after having handled 125 ingots disclosed a small washed area in the center; no firecracks were apparent.

• • •

Prolongs Life of Kettle

Galvanized kettles heated by vertical alloy steel tubes fired from the inside by gas is one of the latest means of keeping the zinc in a molten state. Burning the fuel in the upper section of the tube affords a large portion of the heat to be radiated to the upper part of the kettle where it is most effective. The tubes are built in the brickwork sidewalls at certain intervals depending upon the size of kettle. Advantages claimed for this type galvanizing unit are lack of flame impingement, control of heat input, low dross losses, long life of kettle, low fuel cost, flexibility of firing, kettle replacement and compact kettle setting. The first installation of this type galvanizing furnace recently was completed.

• • •

Provides Porous Surface

Preparing the surface of tin plate for an undercoat of red lead is simplified by washing it with a solution of sal soda before applying the paint. This procedure provides a porous surface so that when the paint is dry, it will adhere without cracking or peeling.

• • •

Lubricants Affect Finish

Where an extra bright finish with little or no coating is desired on the surface of cold heading wire, a lubricant having vegetable oils as a base has been found to give highly efficient results. Animal or mineral base lubricants tend to build up the coating and leave a tacky finish on the surface of the wire being drawn.

Slabbing Mill Flywheel Fabricated from Welded Steel Plates

THIS flywheel weighing 70 tons and measuring 180 inches diameter is being built in the East Pittsburgh works of the Westinghouse Electric & Mfg. Co. for the Inland Steel Co.'s new 46-inch reversing mill at Indiana Harbor, Ind. Fabricated from five welded steel plates it will be used to equalize the load on a 6000-kilowatt motor-generator set which will supply power to the reversing motor on the new mill.

This flywheel will act so as to keep the power consumption from the line within variations of less than 25 per cent, although the load on the blooming mill will vary 200 per cent.

The new reversing mill, complete with auxiliary equipment, will supplement the company's 76-inch hot broad strip mill. It will free the present bloomer of the finishing slabbing passes and thus increase the production of semifinished material. The Inland company also has four basic open-hearth furnaces under construction

Surveys Uses of 34 Nickel-Bronze Casting Mixtures

USE of bronze casting mixtures on which tin is replaced in part by nickel shows a marked increase, according to D. M. Curry, metallurgist, development and research division, International Nickel Co. Inc., New York. Consumption of nickel in such bronzes in 1935 showed an increase of approximately 300 per cent as compared with 1929, and a further gain has been shown so far in 1936.

Mr. Curry's investigation covered 34 nickel-bronze alloys which he found to be in common use. Seven of them, used extensively in nonferrous foundries, are of the following approximate compositions, not including the usual impurities:

No.	Copper	Nickel	Tin	Lead	Zinc
	Per cent				
1	88	2	8	....	2
2	88	5	5	....	2
3	80	2	8	10	....
4	88	4	4	....	4
5	87.50	2	7.5	2	1
6	85	2.5	2.5	9	1
7	87.75	3	8	1.25	....

No. 1 is a modified admiralty bronze which now is extensively used in bearing applications where high strength and pressure resistance are required. No. 2 is a modified admiralty metal in which 5 per cent nickel is substituted for 5 per cent tin; while this metal has high strength and high ductility, it is not extensively used as a bearing metal unless positive lubricating methods are employed. Both Nos. 1 and 2 are being used as babbitt lined bronze bearing backs.

Uses of Other Alloys

No. 3, a modification of S.A.E. specification 64, is being used in many cases where antifriction qualities are desired and it is said to stand up well under heavy loads and severe usage. No. 4, a modification of G-bronze with 4 per cent nickel substituted for a like amount of tin, is being used extensively in the marine field for such products as boat fittings, skegs, rudder parts, deck light frames, oar locks and others. No. 5 is being used on a sizable scale for casting plaques and signs exposed to the elements. No. 6, a modification of S.A.E. specification 66, is being used extensively in the automotive field for babbitt bearing backs, bushings, castings and the like. No. 7, a modification of S.A.E. specification 640, is being used in cones for synchronizer gears in automobile transmissions.

Pressure casting mixtures included in Mr. Curry's investigation included those of the following approximate compositions:

No.	Copper	Nickel	Tin	Lead	Zinc	Phos.
	Per cent					
1	87	1	3	3	6	.....
2	85	1	4	5	5	.....
3	83	1	3	6	7	.....
4	81	1	2	7	9	.....
5	84.75	4	8	0.5	3.5	0.25
6	88	3.5	6.5	....	2	.....
7	84	1	7	3	5	.....
8	78	0.5	2.5	10	9	.....
9	81.50	2	0.5	10	6	.....
10	86	1	3	3	7	.....

Nos. 1 to 4, inclusive, are being used extensively for plumbing fixtures, pressure goods and small parts where the pressure does not exceed 100 pounds per square inch; they are all modifications of the conventional 85-5-5-5 analysis. No. 5 is a high-strength alloy and is used for pressure goods where the pressure is considerably higher than 100 pounds. No. 6 is a modified admiralty metal used by a midwestern valve manufacturer and tests have shown castings of this composition to resist pressures of more than 6000 pounds per square inch. No. 7 is another composition used for pressure goods to withstand high pressures; harder than the majority of compositions and highly fluid, it is used for water meters and other products in which thin cross sections of metal are employed. No. 8 is a special formula used in oil burner pressure gages; it is strongly resistant to leakage. No. 9 is a formula now used for electric refrigerator fittings, being resistant to corrosive attack which may be set up by refrigerant gases. No. 10 is used for locomotive lubricator fittings; it is pressure tight and sufficiently fluid to run thin sections. Castings made from all these formulas are easily machinable.

Approximate compositions for bearings and bushings which were included in Mr. Curry's investigation were as follows:

No.	Copper	Nickel	Tin	Lead	Zinc
	Per cent				
1	88	2	8	....	2
2	80	2	8	10	....
3	83	2	5	7	3
4	85	2	3	9	1
5	85	1.5	3.5	5	5
6	88	2	8	2	....
7	87	2	6	2	3

The above seven formulas all are modifications of S.A.E. specifications. They are used for bearings, babbitt lined bearing backs, bushings, robe rail brackets and similar articles. As the lead content is increased the antifriction qualities improve. Lubricating methods exert an influence on the use of the above formulas for bearing applications.

Five high-lead bearing alloys, of the following approximate compositions, were covered in the investigation:

No.	Copper	Nickel	Tin	Lead	Phos.	Zinc
	Per cent					
1	85	0.5–2	8	5	0.7	0.25
2	80	0.5–2	8	10	0.7	0.5
3	80	0.5–2	8	10	0.05	2.0
4	77	0.5–2	6	15	0.25	0.02
5	73	0.5–2	5	20	0.05	0.02

All five of the above alloys are used extensively today for antifriction bearing applications. The nickel content may vary from 0.5 to 2 per cent, the nickel improving the distribution of the lead and also reducing the amount of lead sweat. In addition to the above, an alloy containing 15 per cent lead, 6 tin, 1 nickel, 0.5 zinc and the remainder copper, is used extensively in railroad appli-

High Strength Alloys Carry More Load

GRABBING 12 tons of coal at each bite, this new unloading bucket is one of three installed at Great Lakes ports by Robins Conveying Belt Co., Passaic, N. J. By ingenious combination of high-strength alloy steel and aluminum, dead weight has been reduced, permitting handling of some 2 tons of coal more per load than formerly. All castings are of alloy steel containing manganese and chromium, except those carrying no strain which are of aluminum. Pins are of heat treated alloy steel and are hollow with solid aluminum cores

cations such as car journals. In casting all these high-lead alloys it is important that the phosphorus content be controlled carefully.

Following extensive tests, an alloy of the following composition now is being used widely for worm gear applications: Copper 87.5, nickel 1.5, tin 11.5, phosphorus 0.1 to 0.2 per cent. It withstands heavy loads and shock and has exceptionally good wearing qualities. It is used extensively for automobile and bus rear wheel axles and for other applications where strength and wearing qualities are of prime importance. A modified admiralty metal now used extensively in gears for medium usage and which has good wearing qualities but less strength than the foregoing composition contains: Copper 88, nickel 2, tin 8, zinc 2 per cent.

The investigation revealed that the following three combinations are used extensively in the ornamental field:

No.	Copper	Nickel	Tin	Lead	Zinc
	Per cent				
1	81	1	1	2	15
2	86	2	2	2	8
3	88	2	8	....	2

These alloys are used for door plaques, grave markers, signs and similar objects. No. 2 seems to be more commonly used. In this class of work the lead content is kept as low as possible without impairing machinability, since high lead retards the action of the elements in the making of a beautiful oxidized finish. Nickel in these three formulas assists the fluidity and prevents shrinkage, especially on castings of thin sections.

Besides the improvement in quality and castability of the above composition due to the use of nickel, says Mr. Curry, there will be formed a slight economy factor due to price differential between nickel and tin.

Welded Truck Frames and Bolsters for Subway Cars

(*Concluded from Page* 36)

cut up with holes required for accessibility to the brake shoes and other working parts, it was believed that a destruction test was the only method by which some idea could be obtained of the overall strength of the truck frame itself.

Fig. 5 shows the test setup in which the main load is applied through the hydraulic jack seen at the bottom of the picture, through an X-shaped member to the swing link hanger pads, and the reaction was taken through four tie rods, the nuts of which seated on the insides of the spring pockets.

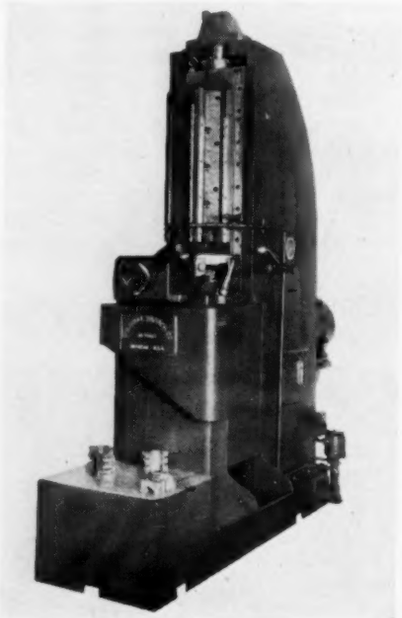
It will be noted that the vertical oval holes in the side member are cut adjacent to the intersection of the transom. These holes are required for the passage of conduit and air pipe connections through the side members. It was believed that this region was beyond analysis, and it was also thought that these holes should be reinforced. For purposes of the destruction test, the reinforcing bands deemed necessary around the holes were not welded.

After the truck frame was thoroughly lime-washed, the load was applied in increments of 5 tons up to 85 tons, and this load was released to determine if any permanent set had occurred. No permanent set was discernible and the load was then increased to 99 tons, at which point failure occurred by crippling of the thin, unsupported transom web at the point where the transom intersects the side member. Fig. 6 is a closeup view of the edge of the buckled web. It appears to be in the nature of a column failure.

No flaking of the lime wash occurred at any point, and the tack welds around the reinforcing bands in the side member broke, which showed the need for reinforcement at that point. The only suspicion of flaking of the lime wash occurred around the 1½-inch hole just below the reinforced openings.

Fig. 7 is another view of the crippled web, taken through the oval holes in the side member. After this transom web crippled and unloaded itself, a general distortion occurred on that side of the frame. It was believed that the ratio of the crippling load to the working load was sufficiently high to warrant use of the design, without making any further changes.

Broaches Bearing Caps



FOUR main bearing caps, cast in one piece, are finish broached from the rough on this single ram broaching machine by a large automobile manufacturer. Joint faces and flat sides of the casting are finished on the left side of the machine, and two slots are broached on the right side of the machine. Photo courtesy Colonial Broach Co., Detroit

Excessive Hard Surfacing May Result in Failure

In the application of hard facing to gain wear resistance, it is not desirable to build up the material to excessive height. In one recent case, failure was encountered with a set of 60 hammers for a hammer mill used for pulverizing herbs for spices. Inspection of an oxyacetylene service man at once revealed the trouble. When sent to the shop for hard facing, the hammers were worn down on the striking ends to a depth of 1½ inch, and the total amount of metal required to replace the worn-off metal was about 1 cubic inch on each hammer.

Instead of building up most of the worn-off metal with steel rods, the shop had built up the entire worn part with the hard facing material. The result was that the hammers, turning at 3000 revolutions per minute, had sufficient striking force when beating the material to knock off the hard-faced ends. These ends broke off with the machine running at high speed, and, in addition to putting the mill out of service, created a dangerous condition because of the flying ends. The procedure recommended was to build up the hammers again, using high-carbon steel or some other suitable material for the base and finish with a thin coat of hard facing.

Safety Sleeves Protect Men Handling Stampings

A large automobile body builder has found that the use of leather safety sleeves, covering the arms of workmen from wrist to elbow, has been the means of considerably reducing accidents from handling sharp metal stampings. In the body building plant, particularly in the press room, there are thousands of pieces of metal with sharp jagged edges, which must be handled regularly by various workmen.

By supplying these workmen with leather safety sleeves, and insisting that they wear them, the management feels that it has saved employes many cuts on their arms. Practice of the company is to furnish these safety sleeves to employes in this hazardous work; if the employe leaves the company, he is required either to turn in the sleeves or reimburse the company for this cost.

IN MILLING OPERATIONS Output is Increased . . Quality Improved *with* SUNOCO

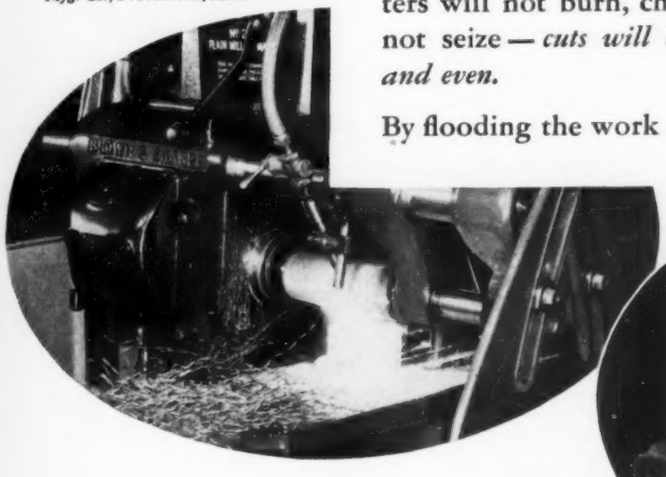
Operation: Milling Crankshaft Counterweights.
Material: Cold Drawn Steel.
Spindle Speed: 65 R. P. M.
Feed: 8" per minute.
Cutting Lubricant: 1 part Sunoco to 20 parts water.
Courtesy of Cincinnati Milling Machine Co.

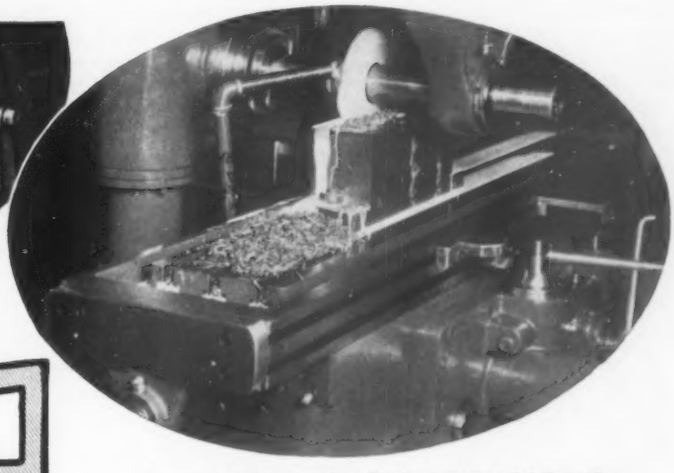
THE lubricating and heat absorbing qualities of Sunoco permit faster milling cutter speed with the feed per minute unchanged. And with that increased speed, cutters will not burn, chips will not seize — *cuts will be clean and even.*

By flooding the work and the cutter with Sunoco, the grinding action of chips on the cutting edges and finished surfaces is prevented.

Sunoco performance, under actual operating conditions in your plant, will convince you that it increases output and improves quality in the milling operations.

Operation: Surface Milling.
Material: Machining Steel.
Spindle Speed: 108 R. P. M.
Feed: 11" per minute.
Cutting Lubricant: 1 part Sunoco to 25 parts water.
Courtesy of Brown & Sharpe Mfg. Co., Providence, R. I.





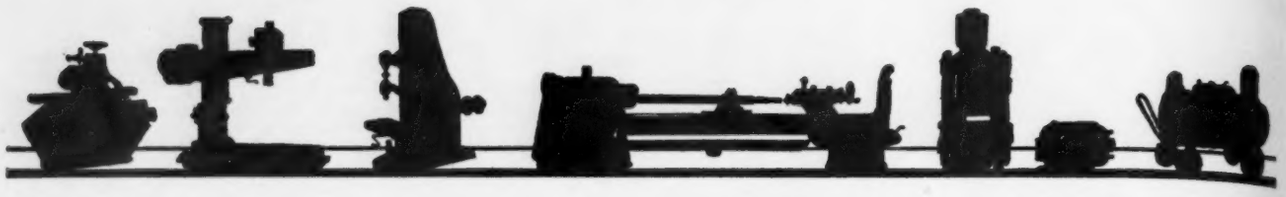
Operation: Slot in Steel Test Block. **Material:** S.A.E. 1035.
Spindle Speed: 60 R. P. M. **Cutter:** 6" Diameter.
Cutting Lubricant: 1 part Sunoco to 20 parts water.
Courtesy of The Producto Machine Co., Bridgeport, Conn.

SUNOCO
EMULSIFYING
CUTTING OIL

SUN OIL COMPANY, PHILADELPHIA, PA., U. S. A.

Subsidiary Companies: Sun Oil Company, Ltd., Montreal, Canada
British Sun Oil Company, Ltd., London, England

New Equipment



Pot Hardening Furnace—

American Gas Furnace Co., Elizabeth, N. J., has just announced a

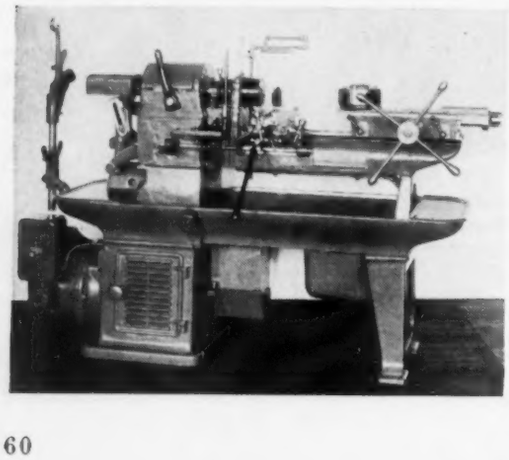
Improved pot hardening furnace recently introduced by American Gas Furnace Co.

new pot hardening furnace for use with lead, cyanide, neutral salt or a carburizing salt as the heating medium. Reduction in gas consumption is reported to result from employment of insulating refractory in the sidewalls and block insulation in back of the walls. The bottom of the furnace slopes downward to a combination drainout and vent. Burners of small size fire tangent to the pot near the top. Venting at the bottom insures maximum utilization of the heat of the products of combustion and a greater amount of heat at the top of the pot where radiation losses are greatest. This arrangement of burners causes heating of the contents from the top downward, avoiding undue strains being set up in the pot during the heating up process. Heat-resisting alloy burners fire into Sillimanite tunnels. Burners are served by a single-valve ratio control.

♦ ♦ ♦

Wire Feed Screw Machine—

Brown & Sharpe Mfg. Co., Providence, R. I. introduces a new wire feed screw machine known as No. 2 to complete its line of three semiautomatic screw machines. Each model is supplied both in motor attached and overhead drive models. These machines are efficiently set up for small run jobs or for parts subject to frequent changes in design where special tooling is not warranted. Wide speed range and high spindle speeds are provided so that all classes of materials can be machined at maximum speed. Ratio of 5 to 1 between fast and slow speeds enables a slow speed to be used for threading and higher speeds for the other type operations. On motor-driven machines slow speed drive is obtained by chain and sprocket. Timesaving features include automatic stock feeding, fast indexing of turret and convenient reversing controls. Adjustable stops on cross and turret slides permit close tolerance. Positive clamp for turret slide bed assures rigidity. Threaded nose of the spindle permits use of standard chucks and special fixtures for operations on castings and forgings. Collets, feeding fingers and many turret tools are interchangeable with the full automatic machines built by the company. On the No. 2 machine, the cross slide is arranged with longitudinal feed by hand and is rated at 1-inch capacity. Spindle speed changes number 20 on motor driven and nine on overhead driven machines.

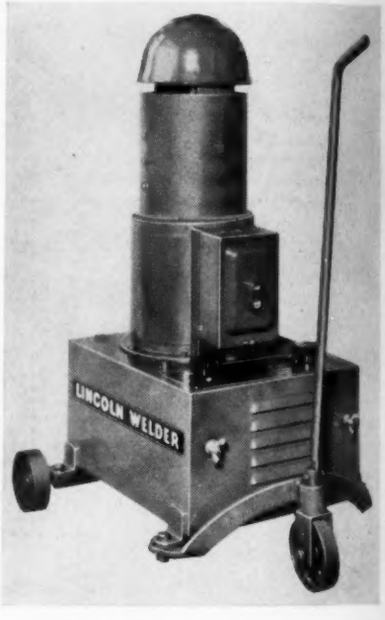


Brown & Sharpe semiautomatic wire feed screw machine available in three sizes

♦ ♦ ♦

Arc Welder—

Lincoln Electric Co., Cleveland, has developed a new motor-driven



Lincoln model SA-150 motor driven single operator type arc welder which uses either bare or shielded arc type electrodes

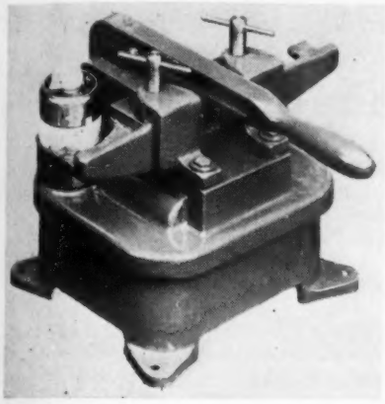
single operator type arc welder for general fabrication and repair work. The machine, with a rated current range of 45 to 200 amperes, is intended for a wide variety of applications, including sheet metal work, hard facing, pipe welding, cast iron repair, fit-up and auxiliary work and regular production work. The machine is protected by class B insulation which permits sustained overloads without injurious effects. Some shops are using this machine with electrodes up to ¼-inch, it is

claimed. The SA-150 has dual control of voltage and current, allowing independent adjustment of arc heat and penetration to suit the operation. The welder is powered by a 7½-horsepower motor and is available for 60-cycle power circuits of 220 or 440 volts, 2 or 3 phase. Either portable or stationary models can be supplied. Floor space two feet square is occupied.

♦ ♦ ♦

Electric Brazer—

Grob Bros., West Allis, Wis., have recently placed on the market an electric brazer for brazing saw bands up to 1½ inches wide. A transformer is mounted in the base and the secondary coil has extensions through the top of the cover which provide for clamping and proper alignment of the ends of the band to be brazed. A center clamp for pressing the saw band ends together



Electric brazer for joining bandsaw blades recently announced by Grob Bros.

when brazed is operated by a handle. A switch mounted in convenient reach of the operator is connected with various windings of the primary coil and provides three different heats. For most satisfactory joints silver solder with a borax flux is recommended. The brazer is made for either 110 or 220-volt single-phase 60-cycle alternating current. Net weight is 50 pounds.

♦ ♦ ♦

Degreasing Machine—

Detroit Rex Products Co., 13005 Hillview avenue, Detroit, has recently added a new two-dip solvent degreasing machine, designated as size 624, to its line. Important features include a water jacket type condenser completely encircling the machine, and a solvent condensate trough located beneath the condenser. This arrangement keeps all solvent vapors within the machine, all pure solvent distillate being emptied into the rinse chamber. Work is usually handled manually

Detrex solvent degreasing machine newly developed by Detroit Rex Products Co.

in baskets or on racks. In heavy work a small hoist may be necessary. This machine is used for both immersion and vapor cleansing, usual sequence of operations being immersion in the cleansing chamber, cooling in the clean solvent rinse, and suspension in the vapors over the boiling chamber. Work is removed clean and dry. The machines contain stabilized chlorinated solvent, which is used repeatedly with slight maintenance. Contamination is removed by periodic distillation within the machine.

♦ ♦ ♦

Cascade Mill—

N. Ransohoff Inc., West Seventy-first street, Carthage, Cincinnati, announces a new cascade mill for removal of scale from forged parts. The process involves holding the forgings in suspension in a mass of hardened stars of graded sizes and steel grit. The forgings are scoured by the tumbling material, yet all features of the design are preserved. The mill is equipped with a star compartment at each end into which all the tumbling material is automatically transferred when a button is pressed, reversing the direction of drum rotation. Work and abrasive material are automatically separated, the work is discharged through a side opening in the drum down a steel incline and a new batch of work is placed in the drum. The motor drive is by V-belt and cut steel gear and pinion. By means of a safety brake operated by a foot treadle, the barrel may be stopped and held in any position.

♦ ♦ ♦

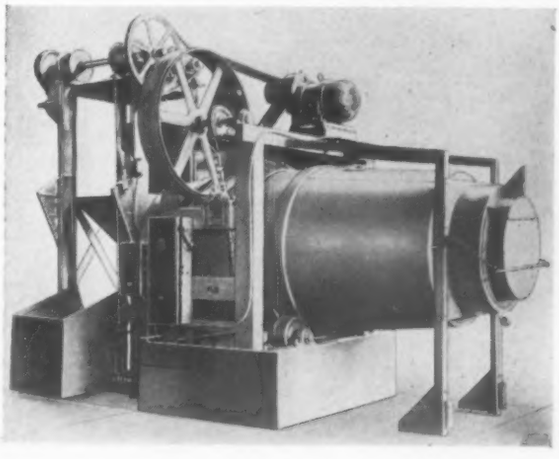
Pallet-Type Lift Truck—

Barrett-Cravens Co., 3255 West Thirtieth street, Chicago, has recently introduced a new hand operated pallet type lift truck to handle 3½-inch pallets. The new truck is made in capacities of 2500 and 3500 pounds. Rear dual wheels are full compensating and ball bearing equipped. Front wheels are actuated on a kingbolt set on a low turntable. One stroke lifts the weight, and a spring holds the handle in an upright position. The lifting mechanism is adjustable. A vertical type oil release check lowers the load.

♦ ♦ ♦

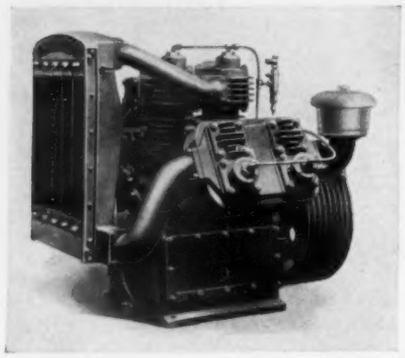
Vertical Compressor—

Worthington Pump & Machinery Corp., Harrison, N. J., is now offering a new line of three and six-cylinder vertical angle two-stage compressors. These units are self



Cascade mill for cleaning forgings developed by N. Ransohoff Inc.

contained and have capacities ranging from 142 to 445 cubic feet per minute. The three-cylinder unit has two low-pressure cylinders set at an angle with a high-pressure cylinder vertically between them. The six-cylinder model is set up in the same way with two cylinders set side by side in each position. Units are available with a multi-V-drive, direct connected to the motor through a flexible coupling or with the motor mounted directly on the end of the crankshaft. Automotive-type pistons with two compression rings, two oil rings and full floating pistons are used on all models. Intercooler is of finned radiator type and is equipped with a fan which draws air through the cooler and over the cylinder head. Lubrication is of force-feed type with oil cooler and oil filter.



Worthington vertical air-cooled compressor available in three or six cylinder models

♦ ♦ ♦

Power Squaring Shears—

Niagara Machine & Tool Works, 637 Northland avenue, Buffalo, N. Y., announces a new series HL power squaring shears designed for high production accurate flat strip cutting. A heavy steel plate structural member is bolted and doweled to the top of the housings in position to counteract the upward thrust of the center bearings and the direct thrust from the hold-down mechanism, at the same time tying the entire machine together at the upper end. The triangular box section steel crosshead with sloping front web permits a large opening between the hold-down bar and the crosshead, giving vision to the cutting line of the machine. This opening enables an operator to view the cut when shearing to a line. The box section steel hold-down is toggle operated and has independent feet exerting increased pressure close to the knife edge, facilitating accurate cutting of flat narrow strips. Drive is through a train of generated spur gears enclosed in a box and running in a bath of oil. All gears run on antifriction bearings.

Niagara series HL power squaring shears designed for high production flat strip cutting

♦ ♦ ♦

Abrasive Mask—

Mine Safety Appliances Co., Braddock, Thomas and Meade streets, Pittsburgh, announces the MSA abrasive mask which is a lightweight and comfortable unit capable of giving protection to the wearer from heavy concentrations of fine dust present in shot and sand-blasting rooms. The complete unit consists of a hood, facepiece and connecting tube, flow control valve, air filter and web belt to support the valve and filter. The mask is equipped with a gas-mask type all-rubber facepiece which is dust tight and adjustable to fit the face. It has a wide vision rectangular glass lens which is protected from the abrasives by an outer cover. Air is fed into the facepiece by a corrugated rubber tube which permits free movement of the head. The hood is constructed of latex covered silk and fits over the head and shoulders of the operator, exposing only the lens of the face piece. The flow control valve is connected at the end of the air tube and has a bump-proof adjustment which assures a continual flow of air at any desired volume.

Abrasive mask developed by Mine Safety Appliances Co. for use in shot and sand blasting work

♦ ♦ ♦

Fire Extinguisher—

Pyrene Mfg. Co., Newark, N. J., announces a new mechanical method for making foam to fight fires, suitable for use with either long or short lines of ¾ to 2½-inch hose. A water stream is converted into a foam stream by means of a new type nozzle, which draws air and a chemical solution into the water. One gallon of the chemical is converted into 350 gallons of foam by the nozzle. Approximately 20 gallons of water per minute at 75 pounds pressure is required for a continuous foam stream of 300 to 400 gallons per minute. The solution is carried in a hip pack by the operator. Stream can be converted into a conventional water stream by lifting the pick-up tube from the solution.

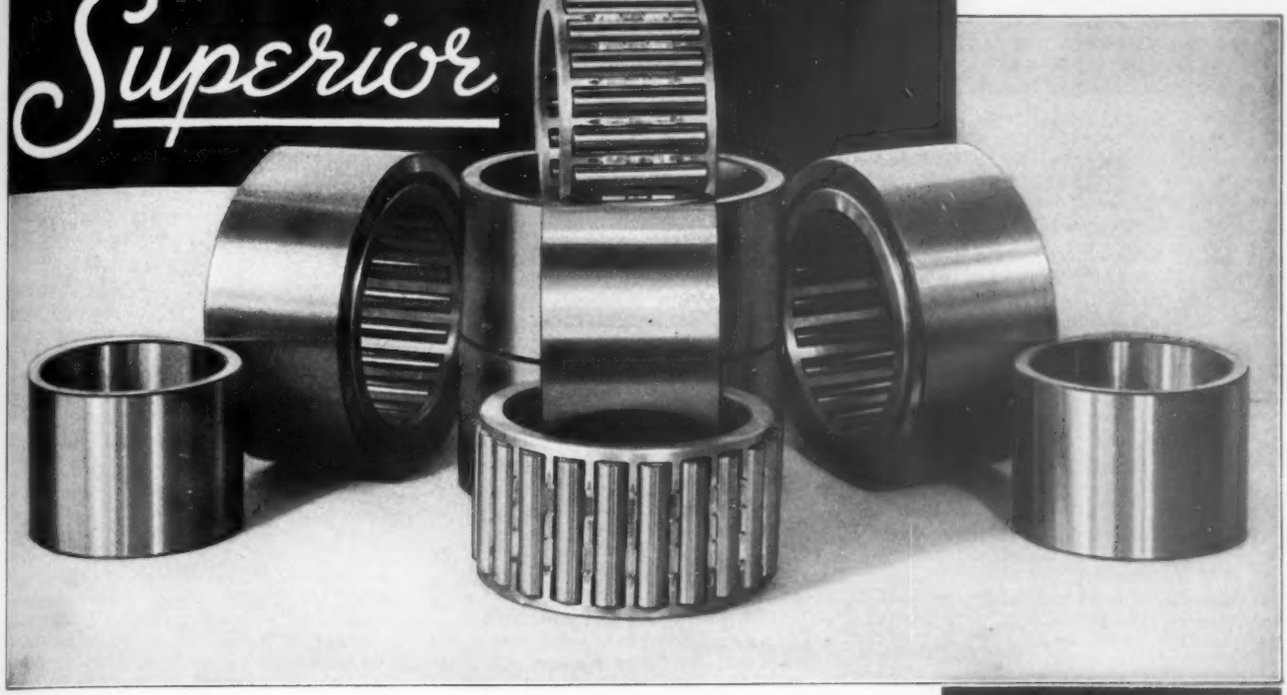
♦ ♦ ♦

Ball Bearing—

Fafnir Bearing Co., New Britain, Conn., announces a new series of ball bearings designed specifically for machine tool applications where compactness is required in addition to precision. The new series supplies standard bearings for applications formerly requiring specially designed bearings. All tolerances are held within close limits. Since the bearings are smaller, large centers, adapters and the like can be used to increase rigidity without increasing overall dimensions, and antifriction bearings may now be used on closely spaced spindles. Designated as the 9500 series, the new bearings are available in bore sizes ranging from 20 millimeters to 260 millimeters. Sizes up to 100 millimeter bore are equipped with solid composition retainers, and machined bronze retainers are used on the larger sizes.

Fafnir 9500 series bearing design for machine tool application

5 YEAR TEST PROVES BANTAM *Superior*



Bantam Roller Bearings for a Cluster Mill. Size 7⅜" I.D. x 12⅝" O.D. x 6" long.

● Back in 1931 a large Eastern manufacturer equipped a Cluster Mill with Bantam Roller Bearings. Their performance has been so satisfactory that the bearings shown have been ordered to equip two more backing rolls on the same mill.

Our customers claim that Bantam Bearings are the most accurate they have ever used. This is giving them lower bearing costs and eliminating production interruptions. That, incidentally, is the reason for *the big swing to Bantams.*

This rapidly growing preference made necessary an increase of 60% in our plant capacity last year—and another even larger expansion this year. Along with this enlargement have come new machines designed to make these fine Bantam Bearings even better.

Follow *the big swing to Bantams*—try them when you next need bearings.

THE SEPTEMBER 1935 REPORT IRON AND STEEL ENGINEER LISTS

MORE NEW **BANTAM** INSTALLATIONS OF ROLL NECK BEARINGS IN THE PRECEEDING 12 MONTHS THAN ALL OTHER MAKES COMBINED

●

THE BANTAM BALL BEARING CO.

(SUBSIDIARY OF THE TORRINGTON CO.)

SOUTH BEND, INDIANA

CHICAGO · PHILADELPHIA · TOLEDO · CLEVELAND · PITTSBURGH · WASHINGTON, D.C. · DETROIT · MILWAUKEE · NEW YORK · ROCHESTER, N.Y. · HARTFORD · NEW ORLEANS · SEATTLE · INDIANAPOLIS

In Canada DOMINION ENGINEERING WORKS, LIMITED, MONTREAL

TAKE YOUR TOUGHEST BEARING JOB TO BANTAM

New Trade Publications

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland.

Pickling Tank Construction—Atlas Mineral Products Co., Mertztown, Pa. Booklet describing and illustrating the modern pickling unit.

Plaster and Metal Partitions—Penn Metal Co., 40 Central street, Boston. Booklet No. 4515 5M 6-36 describing the new Penmetal partition.

Hoist—Lo-Hed Hoist division of the American Engineering Co., Philadelphia. Folder including a brief description of ¼, ½ and one-ton monorail hoists and stationary hoists, with tables of capacities and ratings.

Cutting Tools—Kelly Reamer Co., 3775 Ridge road, Cleveland. Bulletin No. 10-S, illustrates a new development in serrated blade cutting tools, consisting of three component parts —the body, blades and wedges.

Automatic Starters—Electric Controller & Mfg. Co., 2700 East Seventy-ninth street, Cleveland. Sixteen revised bulletins and price sheets; also a new bulletin index and checking list.

Furnace Construction—Hevi Duty Electric Co., Milwaukee, Wis. Bulletin HD-636, describing the Hevi Duty furnace element construction, including illustrations of the more important features in construction.

Insulations—Johns-Manville Corp., 22 East Fortieth street, New York. Booklet form 1N7-A, illustrating and describing more than fifty insulations to best meet a wide variety of industrial requirements.

Photomicrographic Equipment — Bausch & Lomb Optical Co., Rochester, N. Y. Catalog E-21, illustrating and describing various types of camera equipment and accessories for low power photomicrography and miscellaneous items.

Electric Counters—Production Instrument Co., 1235 South Wabash avenue, Chicago. Bulletin No. 16, on precision-built high speed counters, actuated by electrical impulse, low energy consumption plus an accurate count at speeds of 25,000 per hour.

Carbon Dioxide Meter—Republic Flow Meters Co., 2240 Diversey Parkway, Chicago. Data book No. 403, describing developments in measurement of carbon dioxide in a new design of the company's carbon dioxide meter.

Pyrometric Heat Control—Wheelco Instruments Co., 1112 Milwaukee avenue, Chicago. New series of bulletins, prepared by research engineers, presenting analysis of its recently developed pyrometric control instruments.

Flexible Lacquer—Roxalin Flexible Lacquer Co., Elizabeth, N. J. A series of product summaries on flexible finishing materials. Product summaries on other Roxalin flexible finishes will appear regularly during the next few months.

Pillow Blocks—Ahlberg Bearing Co., 317 East Twenty-ninth street, Chicago. Catlog No. S31, giving complete description of light, normal, medium, standard, and heavy duty pillow blocks, including list prices, dimensions and capacities; general information on ball bearings.

Motors—Lincoln Electric Co., Cleveland. Folder No. 206, giving engineering pointers on the application, selection, installation of totally-enclosed fan-cooled motors. Includes tables of prices at horsepower and speed listed, also motor installation data in the form of a table.

Distribution Transformers—Wagner Electric Corp., 6400 Plymouth avenue, St. Louis. Bulletin No. 180, illustrating and describing the mechanical variations and the construction details of the varied distribution transformers including a table of accessories. Bulletin No. 181, describing power transformers.

Oil Burning Unit—American Furnace Co., 2719 Delmar boulevard, St. Louis. Bulletin No. 115-C illustrates and describes new air stream oil burning unit, a combination of counter current air flow and natural air flow held in intimate contact with a direct fired heating surface, over the entire course of flow.

Spray-Finishing Equipment — DeVilbiss Co., Toledo, O. Catalog IB, covering industrial spray-finishing equipment, designed to facilitate selection of the company's spray-finishing equipment items. Complete information is given on spray guns, air compressors, air and fluid hose, exhaust systems, spray booths, exhaust fans, and other equipment.

Screws and Nails—Parker-Kalon Corp., 200 Varick street, New York. Catalog presenting information and technical data relating to use of the company's types of screws and nails, such as fastenings to sheet metal and steel; to iron, brass and aluminum castings; to bakelite, slate and other substances; to masonry; and for fastening sheet metal to wood, etc.

Polishing Wheels—General Abrasive Co., 3109 Hyde Park boulevard, Niagara Falls, N. Y. A chart containing directions for setting up polishing wheels; points covered include correct proportion of glue to water; glue heating; preparation of wheels preparatory to gluing up; dry room temperature and humidity; operating speed and wheel pressure.

Heat Treating Furnaces—Surface Combustion Corp., Toledo, O. Bulletin No. 75, illustrating some installations of standard rated heat treating furnaces, with operating data. Bulletin No. 76, describing three gas-fired muffle type clean hardening furnaces; the D-X gas preparation unit and clean hardening furnace. Also includes operating data.

Gas Pump—Sutorbilt Corp., 2001 East Slauson avenue, Los Angeles. Bulletin No. 67, describing the Sutorbilt gas pump, operative on 1 to 12 pounds pressure or vacuum. Gas booster units are used for raising pressure from a low pressure system to a desired burner pressure; style XB gas pumps are for handling of corrosive or foul gases.

Mill Drive—Patterson Foundry & Machine Co., East Liverpool, O. Bulletin describing the new Patterson mill drive with magnetic brakes and push button which when pushed moves the mill over into the exact position for discharging and reloading. High torque motor and reducer are mounted on heavy cast iron base, eliminating use of concrete.

Universal Laboratory Supports—Gaertner Scientific Corp., 1201 Wrightwood avenue, Chicago. Catalog S-2, on universal laboratory supports, such as rods, bases, clamps and holders, optical benches, scales, microscopes, tools and other supplies. Catalog L-2 on optical instruments such as spectrometers, spectroscopes, spectrographs, polariscopes, interferometers, light sources and accessories.

Heat Treated Die Heads—Landis Machine Co., Waynesboro, Pa. A new operator's instrument book covering R heads for threading machines; Landex type J heads for automatic screw machines; and Landmatic type F heads for turret lathes. Gives detailed data for the correct grinding and setting of Landis chasers and the care and operation of this heat treated and ground series of Landis die heads.

Neutralizing Magnetizing Current—General Electric Co., Schenectady, N. Y. Folder 531 describes method of neutralizing ill effects of magnetizing current, by connecting a G-E Pyranol capacitor directly into the circuit. Bulletin No. 8490-CR1062, on manual motor-starting switches; full-voltage type, direct and alternating current. Bulletin No. 8260, on fractional-horsepower general purpose squirrel-cage induction motors.

Cut-Off Machines—Yoder Co., West Fifty-fifth street and Walworth avenue, Cleveland. Folder describing AC automatic flying cut-off machine; cuts are made by die action; can be changed into a unit for straightening and cutting tubing, wire, and rods to accurate lengths, by adding straightening rolls; formed or developed cuts may be made; holes and slots can be perforated; embossing can be done.

Light Steel Increases Lead Over Heavy

Details of distribution of finished steel made for sale during second quarter and first half, 1936. (See also STEEL, Aug. 17, page 23.)

AMERICAN IRON AND STEEL INSTITUTE
Capacity and Production for Sale of Iron and Steel Products

Second Quarter and First Half — 1936
PERIOD

		Number of companies	Items	Annual Capacity Gross tons	Production for Sale—Gross Tons							
					Current Quarter				To Date (6 Mos. 1936)			
					Total	Per cent of capacity	Shipments: Export	Shipments: To members of the industry for conversion into further finished products	Total	Per Cent of capacity	Shipments: Export	Shipments: To members of the industry for conversion into further finished products
Steel Products	Ingots, blooms, billets, slabs, sheet bars, etc.	33	1	xxxxxxx	1,404,023	xxx	7,439	1,182,284	2,452,662	xxx	10,228	2,082,966
	Heavy structural shapes	9	2	5,280,720	576,648	43.7	13,217	-	1,003,252	38.0	24,399	xxxxxxx
	Steel piling	4	3	265,000	30,983	46.8	697	-	49,915	37.7	1,751	xxxxxxx
	Plates—Sheared and Universal	23	4	6,264,549	562,679	35.9	15,423	5,713	993,236	31.7	30,677	8,463
	Skelp	8	5	xxxxxxx	162,652	xxx	14,544	99,636	276,654	xxx	16,573	173,283
	Rails—Standard (over 60 lbs.)	5	6	4,105,000	373,187	36.4	2,470	-	642,011	31.3	4,892	xxxxxxx
	Light (60 lbs. and under)	6	7	775,820	18,554	9.6	1,359	-	39,845	10.3	7,034	xxxxxxx
	All other (Incl. girder, guard, etc.)	2	8	140,000	11,654	33.3	1,631	-	18,222	26.0	1,892	xxxxxxx
	Splice bar and tie plates	15	9	1,608,793	141,516	35.2	935	-	231,494	28.8	1,762	xxxxxxx
	Bars—Merchant	38	10	xxxxxxx	932,028	xxx	9,936	83,784	1,668,828	xxx	18,248	146,037
	Concrete reinforcing	29	11	xxxxxxx	284,119	xxx	3,478	-	446,302	xxx	5,709	xxxxxxx
	Cold finished—Carbon	17	12	xxxxxxx	148,172	xxx	1,028	-	278,088	xxx	3,217	xxxxxxx
	Alloy—Hot rolled	14	13	xxxxxxx	179,660	xxx	983	9,324	322,926	xxx	2,122	19,093
	—Cold finished	13	14	xxxxxxx	17,811	xxx	44	-	32,789	xxx	73	xxxxxxx
	Hoops and baling bands	3	15	xxxxxxx	17,230	xxx	248	-	32,525	xxx	439	xxxxxxx
	TOTAL BARS	61	16	13,017,493	1,579,020	48.5	15,717	93,108	2,781,458	42.7	29,808	165,130
	Tube rounds	5	17	xxxxxxx	23,122	xxx	-	24,376	41,477	xxx	-	40,904
	Tool steel bars (rolled and forged)	18	18	110,250	10,454	37.9	26	-	18,683	33.9	58	xxxxxxx
	Pipe and tube—B. W.	16	19	1,829,928	199,506	43.6	3,884	-	334,791	36.6	7,665	xxxxxxx
	L. W.	11	20	1,739,534	151,958	34.9	2,971	-	258,652	29.7	5,079	xxxxxxx
	Electric weld	3	21	813,571	47,168	23.2	103	-	66,015	16.2	164	xxxxxxx
	Seamless	15	22	2,655,978 142,350	365,965	55.1	5,730	-	616,939	46.5	10,347	xxxxxxx
	Conduit	6	23		19,815	55.7	385	-	30,690	43.1	678	xxxxxxx
	Mechanical Tubing	5	24	226,900	26,805	47.3	689	-	48,184	42.5	1,414	xxxxxxx
	Wire rods	18	25	xxxxxxx	159,959	xxx	9,156	65,812	320,963	xxx	20,028	130,081
	Wire—Drawn	38	26	1,760,402	284,122	64.6	13,003	5,803	522,915	59.4	22,366	10,227
	—Nails and staples	20	27	1,102,093	136,243	49.4	3,318	-	251,415	45.6	6,045	xxxxxxx
	—Barb., fence, bale ties, fence posts, etc.	24	28	1,534,754	145,877	38.0	8,862	-	267,442	34.9	16,511	xxxxxxx
	Black plate	14	29	460,279	90,845	78.9	1,583	30,408	173,882	75.6	4,070	62,570
	Tin plate	16	30	2,595,480	572,298	88.2	92,405	-	985,171	75.9	175,394	xxxxxxx
	Sheets—Hot rolled	21	31	xxxxxxx	402,727	xxx	7,206	26,368	744,660	xxx	13,956	69,509
	Hot rolled annealed	23	32	xxxxxxx	442,767	xxx	11,557	822	834,648	xxx	21,846	1,989
	Galvanized	17	33	xxxxxxx	273,442	xxx	15,978	-	508,007	xxx	28,847	xxxxxxx
	Cold rolled	19	34	xxxxxxx	529,783	xxx	20,800	-	983,081	xxx	37,955	xxxxxxx
	All other	16	35	xxxxxxx	126,083	xxx	2,276	-	231,845	xxx	4,738	xxxxxxx
	TOTAL SHEETS	31	36	9,183,478	1,774,802	77.3	57,817	27,190	3,302,241	71.9	107,342	71,498
	Strip—Hot rolled	29	37	3,711,531	602,356	64.9	12,550	85,345	1,086,984	58.6	21,442	146,533
	Cold rolled	37	38	1,098,733	161,632	58.8	3,191	-	310,878	56.6	6,716	xxxxxxx
	Wheels (car, rolled steel)	5	39	398,284	35,410	35.6	774	-	60,081	30.2	904	xxxxxxx
	Axles	5	40	425,900	18,263	17.2	269	-	23,318	10.9	329	xxxxxxx
	Track spikes	11	41	350,260	19,275	22.0	252	-	44,437	25.4	571	xxxxxxx
	All other	5	42	20,907	3,928	75.1	2,277	-	6,898	66.0	3,146	xxxxxxx
	TOTAL STEEL PRODUCTS	154	43	xxxxxxx	9,710,719	xxx	292,677	1,619,575	17,260,805	xxx	539,285	2,891,655
	Estimated total steel finishing capacity based on a yield from ingots of 57.3 %		44	45,265,700	xxxxxxx	71.5	xxxxx	xxxxxxx	xxxxxxx	63.5	xxxxxxx	xxxxxxx
	Pig iron, ferro manganese and spiegel	29	45	xxxxxxx	1,292,838	xxx	787	459,467	2,475,345	xxx	1,347	780,955
	Ingot moulds	5	46	xxxxxxx	87,764	xxx	679	-	157,406	xxx	1,966	xxxxxxx
Iron Products	Plates		47									xxxxxxx
	Skelp		48									
	Bars	14	49	249,019	17,226	27.7	-	359	31,806	25.5	15	614
	Splice bars and tie plates		50									xxxxxxx
	Pipe and tubes	4	51	185,457	13,849	29.9	72	-	25,154	27.1	109	xxxxxxx
	Sheets		52									xxxxxxx
	All other	5	53	151,960	13,000	34.2	29	1,520	26,205	34.5	421	2,223
	TOTAL IRON PRODUCTS (ITEMS 47 to 53)	18	54	528,476	44,075	33.4	101	1,879	83,165	31.5	545	2,837

Factory Income in 1935 35 Per Cent Below 1929

Income received from manufacturing amounted to $11,748 million in 1935, according to the National Industrial Conference board, New York.

Salaries and wages represent over four-fifths of the income disbursed in manufacturing. Dividends account for about 15 per cent and other items, such as interest and rent, for only 5 per cent.

Income in manufacturing declined from $18,058 million in 1929 to $8428 million in 1933. In 1935 it was still approximately 35 per cent below the 1929 level. Part of the decline was the result of the drop in prices. Wholesale prices of finished manufacturers declined 26 per cent between 1929 and 1932; those of semi-manufacturers, 37 per cent; and the cost of living, 22 per cent. Consequently the decline in real income was not as drastic as the indicated decline in money income during three years of depression.

First Half Iron Output Gains 37.9 Per Cent

Compiled by American Iron and Steel Institute

DETAILS of pig iron and ferroalloy production in the United States during first half of 1936, compared with first and second halves of 1935 are presented in the accompanying table. A summary was published in STEEL Aug. 17, page 23. Pennsylvania holds its first place in production of steelmaking iron with 3,585,073 gross tons, Ohio second with 2,799,090 tons and the Illinois-Indiana district third with 2,484,140 tons. Degree of integration of steelworks is indicated by the large proportion of basic and bessemer produced for maker's use. By far the larger part of the malleable and other grades for use in foundries was for sale, little being used by producers.

HALF-YEARLY PRODUCTION OF PIG IRON AND FERRO-ALLOYS BY STATES

States	Blast furnaces (a)				Production		
	In blast Dec. 31, 1935	June 30, 1936					
		In	Out	Total	First 6 months 1935	Second 6 months 1935	First 6 months 1936
PIG IRON:							
Mass.	0	1	0	1	614,576	801,179	932,244
New York	8	11	7	18			
Penna.	30	41	34	75	2,482,152	2,997,640	3,752,592
Maryland	4	4	2	6	859,091	922,080	965,692
Virginia	0	0	2	2			
West Va.	3	3	0	3			
Kentucky	1	1	1	2			
Tennessee	1	1	2	3			
Alabama	11	9	12	21	648,405	649,555	995,852
Ohio	27	30	20	50	2,738,100	2,896,430	3,227,197
Illinois	10	13	10	23	938,138	1,065,250	1,350,995
Indiana	10	12	6	18	1,303,142	1,595,336	1,890,895
Michigan	7	6	1	7			
Minnesota	1	1	1	2	126,295	143,391	252,318
Iowa	0	0	0	0			
Missouri	0	0	1	1			
Colorado	1	1	2	3			
Utah	1	1	0	1			
Total	115	135	101	236	9,709,899	11,070,861	13,367,785
FERRO-ALLOYS:							
New York	0	1	0	1	80,945	114,336	103,533
New Jersey	0	0	0	0			
Penna.	5	5	5	10	101,402	118,545	145,565
Virginia	1	1	0	1	31,201	32,363	49,067
West Va.	0	0	0	0			
Tennessee	0	1	1	2			
Alabama	1	1	0	1			
Ohio		2	0	2	44,242	68,905	86,182
Iowa	0	0	0	0			
Total	9	11	6	* 17	† 257,790	† 334,149	† 384,347
Grand total	124	146	107	253	9,967,689	11,405,010	13,752,132

(a) Completed and rebuilding pig iron furnaces.

* Blast furnaces only. Electric furnaces not included.

† Includes ferro-alloys made in electric furnaces.

HALF-YEARLY PRODUCTION OF PIG IRON BY GRADES AND FERRO-ALLOYS BY KINDS

BASIC PIG IRON

States	First 6 months 1935	Second 6 months 1935	First 6 months 1936
New York	343,666	449,653	548,802
Pennsylvania	1,552,713	1,938,022	2,541,602
Maryland, West Va., Kentucky, Ala.	1,006,298	981,887	1,317,577
Ohio	1,785,299	1,673,601	1,991,322
Indiana, Illinois	1,393,998	1,664,915	2,142,227
Michigan, Colorado, Utah	388,248	440,153	526,071
Total	6,470,222	7,148,231	9,067,601

BESSEMER AND LOW-PHOSPHORUS PIG IRON

Pennsylvania	879,212	869,535	1,043,471
New York, Md., West Va., Alabama	229,100	209,452	255,096
Ohio	664,917	795,420	807,768
Indiana, Illinois	305,596	285,460	341,913
Total	2,078,825	2,159,867	2,448,248

FOUNDRY PIG IRON

New York, Massachusetts, Pennsylvania	126,628	315,518	277,017
Md., Va., Ky., Tenn., Alabama	312,093	398,915	441,111
Ohio	76,314	159,239	73,174
Ill., Mich., Minn., Colorado, Utah	93,151	163,394	175,067
Total	608,186	1,037,066	966,369

MALLEABLE PIG IRON

New York, Pennsylvania	152,087	163,747	180,618
Ohio	207,372	262,678	348,874
Indiana, Illinois, Minnesota	179,610	240,250	299,533
Total	539,069	666,675	829,025

FERRO-ALLOYS BY KINDS

Ferro-manganese and spiegeleisen	136,246	153,033	177,284
Ferro-silicon	102,639	160,223	178,847
Other ferro-alloys	18,905	20,893	28,216
Total	257,790	334,149	384,347

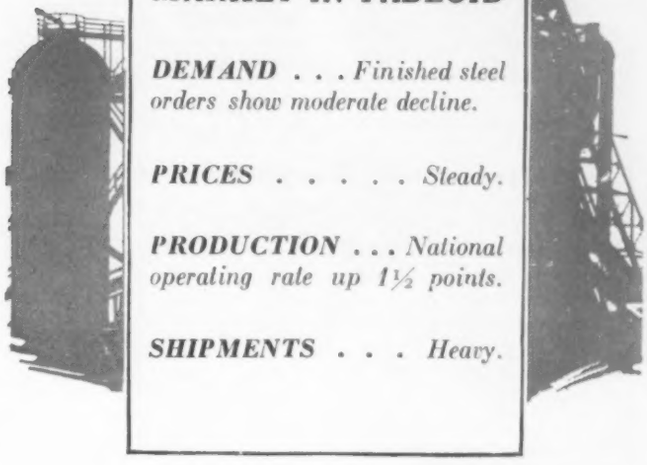
PRODUCTION OF PIG IRON AND FERRO-ALLOYS IN THE FIRST 6 MONTHS OF 1936

(For Sale and for Maker's Use)

	For sale	For maker's use	Total
PIG IRON:			
Basic	660,610	8,406,991	9,067,601
Bessemer and low-phosphorus	130,732	2,317,516	2,448,248
Foundry	778,938	187,431	966,369
Malleable	712,774	116,251	829,025
Forge or mill	17,634		17,634
White and mottled, direct castings, etc.	22,312	16,596	38,908
Total	2,323,000	11,044,785	13,367,785
FERRO-ALLOYS:			
Ferro-manganese and spiegeleisen	70,026	107,258	177,284
Ferro-silicon	176,131	2,716	178,847
Other ferro-alloys	27,851	365	28,216
Total	274,008	110,339	384,347
Grand total	2,597,008	11,155,124	13,752,132

Operating Rate at 72, New Peak for Year

Scrap Composite Up To $15.13, Highest Since October, 1929



MARKET IN TABLOID

DEMAND . . . *Finished steel orders show moderate decline.*

PRICES . . . . . *Steady.*

PRODUCTION . . . *National operating rate up 1½ points.*

SHIPMENTS . . . *Heavy.*

WITH demand still showing greater strength than in any recent comparable season, the national steelworks operating rate last week increased 1½ points to 72 per cent, highest since May, 1930, and 20 points ahead of the same week last year.

Scrap prices rose to the highest levels in more than six years, further narrowing the spread between basic pig iron. STEEL's scrap composite is now at $15.13, an increase of 30 cents from the previous week, and the highest since the last week in October, 1929, when it stood at $15.25. Whereas prices of heavy melting steel and basic pig iron were $13.50 and $19.13, respectively, at Pittsburgh in January, 1935, at present the gap has been reduced to a $16.50-$20.21 relationship.

Because of these sharp advances in scrap, which would lead to more extensive use of pig iron, steelworks operators are studying the obsolescence of blast furnaces. Since 1918, 203 stacks have been dismantled and only 20 built, although the remodeling and enlarging of existing units has resulted in a present rated capacity of 49,777,893 gross tons annually, only 100,000 tons less than in 1919. After the long period of idleness for some blast furnaces during the depression, operators estimate that $25,000,000 would be required to recondition them.

Unusually active demand for coke resulted in two blast furnace interests coming into the beehive coke market last week with inquiries based on their plans to resume production in September.

The uniform open price plan, as inaugurated by the steel industry in March, has proved so successful, according to sellers, that its continuance through the fourth quarter is considered almost certain.

The moderate falling-off in new steel specifications continued last week, but was not reflected in the operating rate because of the backlogs.

Automobile sales are holding up. Last week's production of 73,709 units exceeded output in the previous week by 17,030 and was more than 23,000 units ahead of the same week one year ago. With one manufacturer definitely decided on Sept. 15 for the initial showing of 1937 models, and another likely to make a debut Sept. 8, automotive requirements of steel are gradually becoming more pronounced again.

Eleven contracts each involving between 1000 and 5000 tons helped raise the total of shape awards for the week to 31,41[illegible] tons, a gain of 8790. Pending business included several large projects, one involving 10,000 to 12,000 tons for the Los Angeles union station, and another 10,000 tons for a General Motors building in Elizabeth, N. J.

Railroad car work and shipbuilding had a comparatively quiet week, but here again prospects for future activity are good. Considerable speculation has developed over the plate tonnage likely to be required by the new navy building program.

Prices on foreign iron, manganese, chrome, manganese and manganiferous ores have advanced. Quotations on Spanish and North African ores are up ½ cent a unit. Chrome ore is higher. Some domestic consumers have placed contracts involving requirements through the first quarter of 1937.

STEEL's composite of iron and steel prices is up 6 cents to $33.94, highest level since April, 1930, as a result of the increases in scrap. The finished steel index is still at $53.40.

Operations in the Pittsburgh district were up 4 points to 72 per cent, partly due to the resumption of operations after employe vacations; the Chicago rate was up 1½ to 72½; New England 8 to 78; Detroit 7 to 100; Cincinnati 4 to 76 and eastern Pennsylvania ½ to 50½, Youngstown operations were down 5 points to 74 per cent; Birmingham 3 to 64, and Cleveland 2½ to 79½. Other districts were unchanged.

COMPOSITE MARKET AVERAGES

	Aug. 22	Aug. 15	Aug. 8	One Month Ago July, 1936	Three Months Ago May, 1936	One Year Ago Aug., 1935	Five Years Ago Aug., 1931
Iron and Steel	$33.94	$33.88	$33.82	$33.49	$32.92	$32.68	$30.73
Finished Steel	53.40	53.40	53.40	53.40	52.20	54.02	48.72
Steelworks Scrap	15.13	14.83	14.25	12.89	13.40	12.05	8.79

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Aug. 22, 1936	July 1936	May 1936	Aug. 1935
Finished Material				
Steel bars, Pittsburgh	1.95c	1.95c	1.85c	1.80c
Steel bars, Chicago	2.00	2.00	1.90	1.85
Steel bars, Philadelphia	2.26	2.26	2.16	2.11
Iron bars, Terre Haute, Ind.	1.85	1.85	1.75	1.75
Shapes, Pittsburgh	1.90	1.90	1.80	1.80
Shapes, Philadelphia	2.11½	2.11½	2.01½	2.01½
Shapes, Chicago	1.95	1.95	1.85	1.85
Tank plates, Pittsburgh	1.90	1.90	1.80	1.80
Tank plates, Philadelphia	2.09	2.09	1.99	1.99
Tank plates, Chicago	1.95	1.95	1.85	1.85
Sheets, No. 10, hot rolled, Pitts.	1.95	1.95	1.85	1.85
Sheets, No. 24, hot ann., Pitts.	2.50	2.50	2.40	2.40
Sheets, No. 24, galv., Pitts.	3.20	3.20	3.10	3.10
Sheets, No. 10, hot rolled, Gary	2.05	2.05	1.95	1.95
Sheets, No. 24, hot anneal., Gary	2.60	2.60	2.50	2.50
Sheets, No. 24, galvan., Gary	3.30	3.30	3.20	3.20
Plain wire, Pittsburgh	2.40	2.40	2.40	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pitts.	2.10	2.10	2.10	2.55
Semifinished Material				
Sheet bars, open-hearth, Youngs.	$30.00	30.00	28.00	28.00
Sheet bars, open-hearth, Pitts.	30.00	30.00	28.00	28.00
Billets, open-hearth, Pittsburgh	30.00	30.00	28.00	27.00
Wire rods, Pittsburgh	38.00	38.00	40.00	38.00

	Aug. 22, 1936	July 1936	May 1936	Aug. 1935
Pig Iron				
Bessemer, del. Pittsburgh	$20.8132	20.81	20.81	19.81
Basic, Valley	19.00	19.00	19.00	18.00
Basic, eastern del. East. Pa.	20.8132	20.81	20.81	19.81
No. 2 fdy., del. Pittsburgh	20.3132	20.31	20.31	19.31
No. 2 fdy., Chicago	19.50	19.50	19.50	18.50
Southern No. 2, Birmingham	15.50	15.50	15.50	14.50
Southern No. 2, del. Cincinnati	19.44	20.2007	20.2007	19.38
No. 2X eastern, del. Phila.	21.6882	21.68	20.81	20.68
Malleable, Valley	19.50	19.50	19.50	18.50
Malleable, Chicago	19.50	19.50	19.50	18.50
Lake Sup., charcoal, del. Chicago	25.2528	25.2528	25.2528	24.25
Ferromanganese, del. Pitts.	80.13	80.13	80.13	90.13
Gray forge, del. Pittsburgh	19.6741	19.67	19.67	18.67
Scrap				
Heavy melting steel, Pittsburgh	$16.50	14.15	14.75	13.25
Heavy melt. steel, No. 2, east. Pa.	13.50	11.50	11.71	10.50
Heavy melting steel, Chicago	15.50	13.25	13.05	12.35
Rail for rolling, Chicago	16.50	14.00	14.65	13.65
Railroad steel specialties, Chicago	16.75	14.75	14.65	13.55
Coke				
Connellsville, furnace, ovens	$3.65	3.45	3.50	3.25
Connellsville, furnace, ovens	4.25	4.25	4.25	4.00
Chicago, by-product foundry, del.	9.75	9.75	9.75	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Prices Subject to Quantity Extras and Deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.95c
Gary	2.05c
Chicago, delivered	2.08c
Detroit, del.	2.15c
New York, del.	2.30c
Philadelphia, del.	2.26c
Birmingham	2.10c
St. Louis, del.	2.28c
Pacific ports, f.o.b. cars, dock	2.50c

Hot Rolled Annealed No. 24

Pittsburgh	2.50c
Gary	2.60c
Chicago, delivered	2.63c
Detroit, delivered	2.70c
New York, del.	2.85c
Philadelphia, del	2.81c
Birmingham	2.65c
St. Louis, del	2.82c
Pacific ports, f.o.b. cars, dock	3.15c

Galvanized No. 24

Pittsburgh	3.20c
Gary	3.30c
Chicago, delivered	3.33c
Philadelphia, del.	3.51c
New York, del.	3.55c
Birmingham	3.35c
St. Louis, del.	2.83c
Pacific ports, f.o.b. cars, dock	3.80c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.08c

Cold Rolled No. 10

Pittsburgh	2.60c
Gary	2.70c
Detroit, delivered	2.80c
Philadelphia, del.	2.91c
New York, del.	2.95c
Pacific ports, f.o.b. cars, dock	3.20c

Cold Rolled No. 20

Pittsburgh	3.05c
Gary	3.15c
Detroit, delivered	3.25c
Philadelphia, del.	3.36c
New York, del.	3.40c

Enameling Sheets

Pittsburgh, No. 10	2.45c
Pittsburgh, No. 20	3.05c
Gary, No. 10	2.55c
Gary, No. 20	3.15c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base (box) Pittsburgh	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.50c
Do., Gary	3.60c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plate

Pittsburgh	1.90c
New York, del.	2.19c
Philadelphia, del.	2.09c
Boston, delivered	2.32c
Buffalo, delivered	2.15c
Chicago or Gary	1.95c
Cleveland, del.	2.09½c
Birmingham	2.05c
Coatesville, base	2.00c
Sparrows Pt., base	2.00c
Pacific ports, f.o.b. cars, dock	2.45c
St. Louis, delivered	2.18c

Structural Shapes

Pittsburgh	1.90c
Philadelphia, del.	2.11½c
New York, del.	2.16¼c
Boston, delivered	2.30½c
Bethlehem	2.00c
Chicago	1.95c
Cleveland, del	2.10c
Buffalo	2.00c
Gulf Ports	2.30c
Birmingham	2.05c
Pacific ports, f.o.b. cars, dock	2.45c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	1.95c
Chicago or Gary	2.00c
Duluth	2.10c
Birmingham	2.10c
Cleveland	2.00c
Buffalo	2.05c
Detroit, delivered	2.10c
Pacific ports, f.o.b. cars, dock	2.50c
Philadelphia, del.	2.26c
Boston, delivered	2.37c
New York, del	2.30c
Pitts., forg. qual.	2.20c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.80c
Chicago or Gary	1.85c
Moline, Ill.	1.85c
Cleveland	1.85c
Buffalo	1.90c

Iron

Terre Haute, Ind...	1.85c
Chicago	1.90c
Philadelphia	2.16c
Pittsburgh, refined..	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young...	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. car docks	2.45c
Philadelphia, del.....	2.26c-2.36c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.....	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; less carloads $4 higher; less carloads fencing $5 over base column.)

Base Pitts.-Cleve. 100 lb. keg.	
Stand. wire nails....	2.10c
Cement c't'd nails....	2.10c
Galv. nails, 15 gage and finer	4.10c
do. finer than 15 ga.	4.60c

(Per pound)

Polished staples.....	2.80c
Galv. fence staples	3.05c
Barbed wire, galv...	2.60c
Annealed fence wire	2.65c
Galv. fence wire.....	3.00c
Woven wire fencing (base column, c.l.)	$58.00

To Manufacturing Trade

Plain wire, 6-9 ga..	2.40c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pitts. or Cleveland	3.05c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars and Shafting

Base, Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.25c
20,000 to 59,999 lbs.	2.20c
60,000 to 99,999 lbs.....	2.15c
100,000 lbs. and over.....	2.12½c

Gary, Ind., Cleve., Chi., up 5c; Buffalo, up 10c; Detroit, up 15c; eastern Michigan, up 20c.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons.*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.55c

Alloy		Alloy	
S.A.E.	Diff.	S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni.	1.05
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon Van.	0.95
9200 spring flats	base
9200 spring rounds, squares	0.25

Piling

Pittsburgh	2.25c
Chicago, Buffalo	2.35c

Strip and Hoops

(Base, hot rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23/16-in.	
Pittsburgh	1.95c
Chicago or Gary	2.05c
*Birmingham base	2.10c
Detroit, del.	2.15c
Philadelphia, del.	2.26c
New York, del.....	2.30c
Cooperage hoop, Pittsburgh	2.05c
Chicago	2.15c
Cold strip, 0.25 carbon and under, Pitts., Cleveland..	2.60c
Detroit, del.	2.81c
Worcester, Mass..	2.80c

Carbon	Cleve-Pitts.	Worcester, Mass.
0.26—0.50....	2.60c	2.80c
0.51—0.75....	3.45c	3.65c
0.76—1.00....	4.95c	5.15c
Over 1.00....	6.50c	6.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 20—100 lbs.	25.50-28.00
Light rails, billet qual. Pitts., Chi....	$35.00
Do., reroll. qual....	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel.....	2.10c
Spikes, R. R. base..	2.60c
Track bolts, base....	3.60c
Tie plates, base.....	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $2; 16 and 20 lbs., up $1; 12 lbs. up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller.....	70-10 off
Do. larger	70-5 off
Tire bolts	50 off

Plow Bolts

All sizes	70-5 off

Stove Bolts

In packages with nuts attached 75 off; in packages with nuts separate 75-5 off; in bulk 82½ off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	65 off
Elevator bolts	65 off

Nuts

S. A. E. semifinished hex.:	
½ to 7/8-inch.....	60-20-15 off
Do., ½ to 1-inch....	60-20-15 off
Do., over 1-inch....	60-20-15 off

Hexagon Cap Screws

Milled	80-10-10 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller.....	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	3.05c
Struc., c. l., Chicago	3.15c
7/8-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila. to jobbers & large nut, bolt mfrs.....	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more, no discount on size extras	$3.05
Do., under 5 kegs; no disc. on size extras.....	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ points less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
¼ and ⅜.....	60	44½
½.....	64½	55
¾.....	67½	59
1—3.....	69½	61½

Iron

½.....	31½	15
¾.....	36½	20½
1—1¼.....	39½	25½
2.....	41½	26

Lap Weld

Steel

2.....	62	53½
2½—3.....	65	56½
3½—6.....	67	58½
7 and 8.....	66	56½
9 and 10.....	65½	56

Iron

2.....	37	22½
2½—3½.....	38	25
4—8.....	40	28½

Line Pipe

Steel

⅛, butt weld.....	56
¼ and ⅜, butt weld.....	59
½, butt weld	63½
¾, butt weld	66½
1 to 3, butt weld	68½
2, lap weld	61
2½ to 3, lap weld.....	64
3½ to 6, lap weld.....	66
7 and 8, lap weld.....	65

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		Charcoal Iron	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935, card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.....	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham...	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago..	47.40-48.40
6-in. & over, east. fdy.	43.00
Do., 4-in.	46.00

Class A pipe $3 over Class B

Stnd. fitgs., Birm. base..	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo & Young.	$30.00
Philadelphia	35.67
Duluth	32.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chi., Buff.....	37.00
Forging, Duluth	39.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	30.00

Slabs

Pitts., Chi., Cleve., Young.	30.00

Wire Rods

Pitts., Cleve., No. 4 to 5	$38.00
Do., No. 5 to 9/32-inch	40.00
Do., over 11/32 to 7/16-inch	42.00

Chicago up $1; Worcester up $2

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point....	1.80c

Coke

Price Per Net Ton

Beehive Ovens

*Connellsville, fur...	$3.65- 3.75
Connellsville, fdry...	4.25- 4.50
Connel. prem. fdry.	5.50
New River fdry.....	6.00
Wise county fdry....	4.45- 5.00
Wise county fur.....	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9 70-10.15
Chi., ov., outside del.	9.00
Chicago, del.	9.75
New England, del....	11.50
St. Louis, del.	10.00-10.50
Birmingham, ovens	6.50
Indianapolis, del.	9.40
Cincinnati, del.	9.50
Cleveland, del.	9.75
Buffalo, ovens	7.50- 8.00
Detroit, ov., out. del.	9.00
Philadelphia, del.	9.38

Coke By-Products

Per gallon, producers' plants.

Tank lots	Spot
Pure and 90% benzol.....	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford,

Phenol (200 lb. drums)..	15.50c
Do. (450 lbs.)	14.50c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	7.25c

Per 100 lbs. Atlantic seaboard

Sulphate of ammonia.....	$1.25

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$20.50	$21.00	$20.00	$21.50
Birdsboro, Pa.	20.50	21.00	20.00	21.50
Birmingham, Ala., southern del.	15.50	15.50	14.50	21.00
Buffalo	19.50	20.00	18.50	20.50
Chicago	19.50	19.50	19.00	20.00
Cleveland	19.50	19.50	19.00	20.00
Detroit	19.50	19.50	19.00	20.00
Duluth	20.00	20.00	.....	20.50
Erie, Pa.	19.50	20.00	19.00	20.50
Everett, Mass.	20.50	21.00	20.00	21.50
Hamilton, O.	19.50	19.50	19.00	.....
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	19.50	19.50	19.00	20.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	19.50	19.50	19.00	20.00
Sparrows Point, Md.	20.50	.....	20.00	.....
Swedeland, Pa.	20.50	21.00	20.00	21.50
Toledo, O.	19.50	19.50	19.00	20.00
Youngstown, O.	19.50	19.50	19.00	20.00
Delivered from Basing Points:				
Akron, O., from Cleveland	20.76	20.76	26.26	21.26
Baltimore from Birmingham	21.08	.....	19.96	.....
Boston from Birmingham	20.62	.....	20.50	.....
Boston from Everett, Mass.	21.00	21.50	20.50	22.00
Boston from Buffalo	21.00	21.50	20.50	22.00
Brooklyn, N. Y., from Bethlehem	22.93	23.43	.....	.....
Brooklyn, N. Y., from Bmghm.	22.50	.....	.....	.....
Canton, O., from Cleveland	20.76	20.76	20.26	21.26
Chicago from Birmingham	†19.72	.....	19.60	.....
Cincinnati from Hamilton, O.	19.82	20.58	20.08	.....
Cincinnati from Birmingham	19.44	.....	18.44	.....
Cleveland from Birmingham	19.62	.....	19.12	.....
Indianapolis from Hamilton, O.	21.17	21.77	21.27	.....
Mansfield, O., from Toledo, O.	21.26	21.26	20.76	21.76
Milwaukee from Chicago	20.57	20.57	20.27	21.07
Muskegon, Mich., from Chicago Toledo or Detroit	22.60	22.60	22.10	23.10
Newark, N. J., from Birmingham	21.61	.....	.....	.....
Newark, N. J., from Bethlehem	21.99	22.49	.....	.....
Philadelphia from Birmingham	20.93	.....	20.81	.....
Philadelphia from Swedeland, Pa.	21.31	21.81	20.81	.....
Pittsburgh district from Neville Island	Neville base plus 67c, 81c and $1.21 switching charges			
Saginaw, Mich., from Detroit	21.75	21.75	21.25	21.25
St. Louis, northern	20.00	20.00	19.50	.....
St. Louis from Birmingham	†19.68	.....	19.50	.....
St. Paul from Duluth	21.94	21.94	.....	22.44

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $24.00, Phila. base, standard and copper bearing, $25.13.

Gray Forge		Charcoal	
Valley furnace	19.00	Lake Superior fur.	$22.00
Pitts. dist. fur.	19.00	Do., del. Chicago	25.26
		Lylees, Tenn.	22.50

Silvery†

Jackson county, O., base; 6-6.50 per cent $22.75; 6.51-7—$23.25; 7-7.50—$23.75; 7.51-8—$24.25; 8-8.50—$24.75; 8.51-9—$25.25; 9-9.50—$25.75. Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silvery, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1. per ton.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$55.00

First Quality

Pa., Ill., Md., Mo., Ky.	$45.00
Alabama, Georgia	$38.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo.	40.00
Georgia, Alabama	35.00

Ohio

First quality	$40.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	48.00

Ladle Brick (Dry Press)

Pa., O., W. Va., Mo.	$24.00
Do., wire cut	22.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chem. bonded chrome	45.00
Magnesite brick	65.00
Chem. bonded magnesite	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$21.50
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$18.00
Do., for barge	$19.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	75.00
Do., Balti., base	75.00
Do., del. Pittsb'gh	80.17
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicoman., 2½ carb.	85.00
2% carbon, 90.00; 1%,	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. con. del.	1.30- 1.40
Ferrovanadium, 35 to 40% lb., cont.	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
Aug. 15	9.75	9.87½	9.40	42.00	40.70	4.60	4.45	4.80	*19.00	12.50	35.00
Aug. 17	9.75	9.87½	9.40	42.00	40.70	4.60	4.45	4.80	*19.00	12.50	35.00
Aug. 18	9.75	9.87½	9.40	42.00	40.75	4.60	4.45	4.80	*19.00	12.50	35.00
Aug. 19	9.75	9.87½	9.40	42.50	41.30	4.60	4.45	4.80	*19.00	12.50	35.00
Aug. 20	9.75	9.87½	9.40	42.35	41.12½	4.60	4.45	4.80	*19.00	12.50	35.00
Aug. 21	9.75	9.87½	9.40	42.25	41.00	4.60	4.45	4.80	*19.00	12.50	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.75c Conn. copper

Sheets

Yellow brass (high)	15.37½
Copper, hot rolled	17.25
Lead cut to jobbers	8.25
Zinc, 100-lb. base	9.50

Tubes

High yellow brass	17.62½
Seamless copper	17.75

Rods

High yellow brass	13.37½
Copper, hot rolled	14.00

Anodes

Copper, untrimmed	14.75

Wire

Yellow brass (high)	15.62½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass

New York	6.12½-6.37½
Cleveland	6.40- 6.75
*Chicago	6.12½-6.37½
St. Louis	5.75- 6.25

Heavy Copper and Wire

New York, No. 1	7.75- 8.00
Chicago, No. 1	7.50- 7.75
Cleveland, No. 1	7.25- 7.75
St. Louis, No. 1	7.50- 7.75

Composition Brass Borings

New York	5.87½-6.12½

Light Copper

New York	6.50- 6.62½
*Chicago	6.12½- 6.75
Cleveland	6.00- 6.25
St. Louis	6.00- 6.50

Light Brass

*Chicago	3.62½-3.87½
Cleveland	3.40- 3.65
St. Louis	3.40- 3.90

Lead

New York	3.62½-3.87½
*Cleveland	3.75- 3.80
Chicago	3.25- 3.75
St. Louis	3.25- 3.75

Zinc

New York	2.37½-2.62½
St. Louis	2.25- 2.50
Cleveland	2.25- 2.50

Aluminum

*Borings, Cleveland	9.00-10.00
*Mixed, cast, Cleve.	12.75-13.00
Mixed, cast, St. L.	11.25-11.75
*Clips, soft, Cleve.	15.00-15.50

SECONDARY METALS

Brass ingot, 85-5-5-5	9.75
Stand. No. 12 alum.	16.50-17.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham†	9.00-12.00
Bos. d'ck, No. 1, exp.	†11.75
N. Eng. del. No. 1..	11.75
Buffalo, No. 1	13.50-14.00
Buffalo, No. 2	12.00-12.50
Chicago, No. 1	15.50-16.00
Cleveland, No. 1	14.50-15.00
Cleveland, No. 2	13.50-14.00
Detroit, No. 1	12.50-13.00
Eastern Pa., No. 1..	14.50
Eastern Pa., No. 2..	13.50
Federal, Ill.	11.75-12.75
Granite City, R. R.	13.00-13.50
Granite City, No. 2	11.00-11.50
New York, No. 2	†9.50-10.00
N. Y. d'ck, No. 1,exp.	†11.25-11.50
Pitts., No. 1 (R. R.)	17.00-17.50
Pitts., No. 1 (dlr.)..	16.25-16.75
Pittsburgh, No. 2	14.75-16.25
St. Louis, R. R.	13.00-13.50
St. Louis, No. 2	11.50-12.00
Toronto, dealers	7.50
Valleys, No. 1	14.75-15.25

COMPRESSED SHEETS

Buffalo, dealers	12.00-12.50
Chicago, factory	13.50-14.00
Chicago, dealer	12.25-12.75
Cleveland	13.50-14.00
Detroit	12.50-13.00
E. Pa., new mat.	13.50-14.00
E. Pa., old mat	11.00-11.50
Pittsburgh	16.25-16.75
St. Louis	11.00-11.50
Valleys	14.50-14.75

BUNDLED SHEETS

Buffalo	10.50-11.00
Cincinnati, del.	8.50- 9.00
Cleveland	10.50-11.00
Pittsburgh	14.75-15.25
St. Louis	8.25- 8.75
Toronto, dealers	4.50

SHEET CLIPPINGS, LOOSE

Chicago	8.50- 9.00
Cincinnati	7.25- 7.75
Detroit	9.00- 9.50
St. Louis	7.50- 8.00

STEEL RAILS, SHORT

Birmingham	11.50-12.00
Buffalo	15.50-16.00
Chicago (3 ft.)	17.25-17.75
Chicago (2 ft.)	17.75-18.25
Cincinnati, del.	15.50-16.00
Detroit	15.50-16.00
Pitts., open-hearth, 3 ft. and less	18.50-19.00
St. Louis, 2 ft. & less	16.00-16.50

STEEL RAILS, SCRAP

Boston district	†8.75- 9.00
Buffalo	13.50-14.00
Chicago	15.50-16.00
Pittsburgh	16.75-17.25
St. Louis	14.50-15.00
Toronto, dealers	8.50

STOVE PLATE

Birmingham	8.00- 9.00
Boston district	†7.25- 7.50
Buffalo	10.00-10.25
Chicago	9.00- 9.50
Cincinnati, dealers..	8.50- 9.00
Detroit, net	9.00- 9.50
Eastern Pa.	12.00-12.50
New York, fdry	† 7.25- 7.75
St. Louis	8.50- 9.00
Toronto, dealers, net	5.50

COUPLERS, SPRINGS

Buffalo	15.00-15.50
Chicago, springs	17.00-17.50
Eastern Pa.	18.00-18.50
Pittsburgh	18.75-19.25
St. Louis	14.50-15.00

ANGLE BARS—STEEL

Chicago	16.50-17.00
St. Louis	15.00-15.50
Buffalo	14.50-15.00

RAILROAD SPECIALTIES

Chicago	16.50-17.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	15.00-15.50
Cleveland, billet, bloom crops	17.50-18.00
Eastern Pa., crops..	17.50-18.00
Pittsburgh, billet, bloom crops	19.00-19.50
Pittsburgh, sheet bar crops	18.75-19.25

FROGS, SWITCHES

Chicago	14.00-14.50
St. Louis, cut	14.00-14.50

SHOVELING STEEL

Chicago	15.50-16.00
Federal, Ill.	11.75-12.25
Granite City, Ill.	11.50-12.00
Toronto, dealers	6.50

RAILROAD WROUGHT

Birmingham	7.50- 8.00
Boston district	†7.25- 7.50
Buffalo, No. 1	12.00-12.50
Buffalo, No. 2	13.50-14.00
Chicago, No. 1, net..	14.00-14.50
Chicago, No. 2	15.50-16.00
Cincinnati, No. 2	12.50-13.00
Eastern Pa.	14.50-15.00
St. Louis, No. 1	11.75-12.25
St. Louis, No. 2	12.50-13.00
Toronto, No. 1 dlr.	7.00

SPECIFICATION PIPE

Eastern Pa.	12.50
New York	†8.75- 9.25

BUSHELING

Buffalo, No. 1	12.00-12.50
Chicago, No. 1	14.50-15.00
Cinci., No. 1, deal.	9.75-10.25
Cincinnati, No. 2	5.50- 6.00
Cleveland, No. 2	9.50-10.00
Detroit, No. 1, new	11.50-12.00
Valleys, new, No. 1..	14.50-14.75
Toronto, dealers	6.00

MACHINE TURNINGS

Birmingham	4.00- 5.00
Buffalo	7.00- 7.50
Chicago	8.50- 9.00
Cincinnati, dealers..	6.50- 7.00
Cleveland	8.75- 9.00
Detroit	7.50- 8.00
Eastern Pa.	9.00- 9.50
New York	†5.25- 5.50
Pittsburgh	10.50-11.00
St. Louis	6.00- 6.50
Toronto, dealers	4.00
Valleys	10.25-10.75

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†3.25- 4.25
Buffalo	8.50- 9.00
Cincinnati, dealers..	5.50- 6.00
Cleveland	9.50-10.00
Detroit	8.00- 8.50
Eastern Pa.	7.50- 8.00
New York	†4.75- 5.00
Pittsburgh	11.00-11.50
Toronto, dealers	4.00

CAST IRON BORINGS

Birmingham, plain..	4.00- 5.00
Boston dist. chem...	†6.25- 6.75
Boston dist. for mills	†4.50- 5.00
Buffalo	8.50- 9.00
Chicago, dealers	7.50- 8.00
Cincinnati, dealers..	5.50- 6.00
Cleveland	9.50-10.00
Detroit	8.00- 8.50
E. Pa., chemical	10.00-13.00
New York	†5.50- 5.75
St. Louis	4.50- 5.00
Toronto, dealers	5.00

PIPE AND FLUES

Cincinnati, dealers..	8.00- 8.50
Chicago, net	8.00- 8.50

RAILROAD GRATE BARS

Buffalo	10.50-11.00
Chicago, net	10.00-10.50
Cincinnati	8.00- 8.50
Eastern Pa.	12.00
New York	†7.25- 7.75
St. Louis	10.00-10.50

FORGE FLASHINGS

Boston district	†8.25- 8.75
Buffalo	12.00-12.50
Cleveland	13.00-13.50
Detroit	10.50-11.00
Pittsburgh	14.75-15.25

FORGE SCRAP

Boston district	†5.50- 6.00
Chicago, heavy	17.75-18.25
Eastern Pa.	14.00

ARCH BARS, TRANSOMS

St. Louis	14.50-15.00

AXLE TURNINGS

Boston district	†7.00- 7.25
Buffalo	11.00-11.50
Chicago, elec. fur.	14.00-14.50
Eastern Pa.	12.50-13.00
St. Louis	9.50- 10.00
Toronto	4.50

STEEL CAR AXLES

Birmingham	11.50-12.50
Boston district	†12.00-12.50
Buffalo	15.50-16.00
Chicago, net	17.50-18.00
Eastern Pa.	17.50-18.00
St. Louis	15.50-16.00
Toronto	8.50

SHAFTING

Boston district	†14.25-14.75
Eastern Pa.	20.00-21.50
New York	†15.00-15.50
St. Louis	14.00-14.50

CAR WHEELS

Birmingham	11.00-11.50
Boston dist. iron	†9.50-10.00
Buffalo, iron	13.50-14.00
Buffalo, steel	15.50-16.00
Chicago, iron	15.50-16.00
Chicago, rolled steel	17.50-18.00
Cincinnati, iron	12.25-12.75
Eastern Pa., iron	16.00-17.00
Eastern Pa., steel	18.00-18.50
Pittsburgh, iron	16.50-17.00
Pittsburgh, steel	18.75-19.25
St. Louis, iron	13.50-14.00
St. Louis, steel	14.50-15.00
Toronto, net	8.50

NO. 1 CAST SCRAP

Birmingham	11.00-12.00
Bos. dis. No. 1 mch.	†10.25-10.50
N. Eng., del. No. 2..	10.00-10.50
N. Eng. del. textile..	11.50-12.00
Buffalo, cupola	12.75-13.25
Buffalo, mach.	14.00-14.50
Chicago, agri. net..	12.00-12.50
Chicago, auto	13.25-13.75
Chicago, mach. net..	13.50-14.00
Chicago, railr'd net..	12.50-13.00
Cinci., mach. cup	12.75-13.25
Cleveland, mach.	15.25-15.75
Eastern Pa., cupola	15.50-16.00
E. Pa., mixed yard..	14.00
Pittsburgh, cupola..	16.00-16.50
San Francisco, del..	13.50-14.00
Seattle	10.00-11.00
St. Louis, No. 1	11.50-12.00
St. L., No. 1 mach.	12.50-13.00
Toronto, No. 1 mach., net	9.00

HEAVY CAST

Boston dist. break...	†9.50-10.00
New England del.	10.00-10.25
Buffalo, break.	11.50-12.00
Cleveland, break.	12.50-13.00
Detroit, No. 1 mach. net	13.00-13.50
Detroit, break.	11.50-12.00
Detroit, auto net	12.50-13.00
Eastern Pa.	15.00-15.50
New York breakable	†11.00-11.50
Pittsburgh	13.50-14.00

MALLEABLE

Birmingham, R. R..	11.50-12.50
New England del.	15.00-16.00
Buffalo	15.50-16.00
Chicago, R. R.	17.00-17.50
Cincinnati, agri. del.	13.00-13.50
Cleveland, rail	16.00-16.50
Detroit, auto, net	14.50-15.00
Eastern Pa., R. R.	17.50
Pittsburgh, rail	16.50-17.00
St. Louis, R. R.	14.50-15.00
Toronto, net	7.00

RAILS FOR ROLLING

5 feet and over

Birmingham	11.50-12.50
Boston district	†10.50-11.00
Buffalo	14.25-14.75
Chicago	16.25-16.75
Eastern Pa.	15.50
New York	†11.50-12.00
St. Louis	15.00-15.50

LOCOMOTIVE TIRES

Chicago (cut)	16.00-16.50
St. Louis, No. 1	12.50-13.00

LOW PHOS. PUNCHINGS

Buffalo	15.00-15.50
Chicago	17.50-18.00
Eastern Pa.	17.50
Pittsburgh (heavy)	18.75-19.25
Pittsburgh (light)	17.50-18.00

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	11.00
No. Afr. low phos.	11.00
Swedish basic, 65%	9.50
Swedish low phos.	10.50
Spanish No. Africa basic, 50 to 60%	11.00
Tungsten, spot sh. ton unit, duty pd.	$15.85-16.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	19.50-19.75

Manganese Ore

(Nominal)

Prices not including duty cents per unit cargo lots

Caucasian, 50-52%	26.00
So. African, 50-52%	27.00
Indian, 50-52%	26.00

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore*	3.10c
Boston††	3.20c
Buffalo	3.10c
Chattanooga	3.46c
Chicago (j)	3.10c
Cincinnati	3.32c
Cleveland	3.00c
Detroit	3.19c
Houston	3.10c
Los Angeles	3.70c
Milwaukee	3.21c-3.36c
New Orleans	3.45c
New York‡ (d)	3.41c
Pitts. (h)	3.05c-3.20c
Philadelphia*	3.15c
Portland	3.60c
San Francisco	3.35c
Seattle	3.80c
St. Louis	3.35c
St. Paul	3.35c-3.50c
Tulsa	3.35c

IRON BARS

Portland	3.50c
Chattanooga	3.46c
Baltimore*	3.10c
Chicago	2.85c
Cincinnati	3.32c
New York‡(d)	3.15c
Philadelphia*	3.15c
St. Louis	3.35c
Tulsa	3.35c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.46c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Angl., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.35c
Tulsa	3.25c
Young	2.30c-2.60c

SHAPES

Baltimore*	3.10c
Boston††	3.29c
Buffalo	3.35c
Chattanooga	3.66c
Chicago	3.30c
Cincinnati	3.52c
Cleveland	3.41c
Detroit	3.52c
Houston	3.10c
Los Angeles	3.70c
Milwaukee	3.41c
New Orleans	3.65c
New York‡(d)	3.47c
Philadelphia*	3.10c
Pittsburgh (h)	3.25c
Portland (i)	3.60c
San Francisco	3.35c
Seattle (i)	3.80c
St. Louis	3.45c
St. Paul	3.55c
Tulsa	3.60c

PLATES

Baltimore*	3.10c
Boston††	3.31c
Buffalo	3.47c
Chattanooga	3.66c
Chicago	3.30c
Cincinnati	3.52c
Cleveland, ¼-in. and over	3.41c
Detroit	3.52c
Detroit, 5/16-in.	3.85c
Houston	3.10c
Los Angeles	3.70c
Milwaukee	3.41c
New Orleans	3.65c
New York‡(d)	3.50c
Philadelphia*	3.10c
Phila. floor	4.95c
Pittsburgh (h)	3.25c
Portland	3.60c
San Francisco	3.35c
Seattle	3.65c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.60c

NO. 10 BLUE

Baltimore*	3.10c
Boston (g)	3.40c
Buffalo	3.72c
Chattanooga	3.46c
Chicago	3.15c
Cincinnati	3.32c
Cleveland	3.21c
Det. 8-10 ga.	3.24c
Houston	3.45c
Los Angeles	3.85c
Milwaukee	3.26c
New Orleans	3.65c
New York‡(d)	3.41c
Portland	3.85c
Philadelphia*	3.20c
Pittsburgh (h)	3.05c
San Francisco	3.45c
Seattle	3.85c
St. Louis	3.40c
St. Paul	3.40c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	3.70c
Boston (g)	4.05c
Buffalo	3.35c
Chattanooga*	3.41c
Chicago	3.95c
Cincinnati	4.12c
Cleveland	3.91c
Detroit	4.04c
Los Angeles	4.45c
Milwaukee	4.06c
New Orleans	4.50c
New York‡(d)	3.99c
Philadelphia*†	3.75c
Pitts.**(h)	3.55c-4.85c
Portland	4.20c
San Francisco	4.10c
Seattle	4.50c
St. Louis	4.20c
St. Paul	4.00c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	3.90c
Buffalo	4.10c
Boston (g)	4.00c
Chattanooga*	3.96c
Chicago (h)	4.65c
Cincinnati	4.82c
Cleveland	4.61c
Detroit	4.82c
Houston	4.50c
Los Angeles	4.50c
Milwaukee	4.76c
New Orleans	4.95c
N. Y.‡ (d)	4.30-4.50c
Philadelphia*†	4.50c
Pitts.**(h)	4.30c-5.55c
Portland	4.60c
San Francisco	4.60c
Seattle	5.10c
St. Louis	4.90c
St. Paul	4.60c
Tulsa	5.20c

BANDS

Baltimore*	3.30c
Boston††	3.40c
Buffalo	3.52c
Chattanooga	3.71c
Chicago	3.40c
Cincinnati	3.57c
Cleveland	3.46c
Detroit, 5/16-in. and lighter	3.49c
Houston	3.35c
Los Angeles	4.20c
Milwaukee	3.51c
New Orleans	4.05c
New York‡(d)	3.66c
Philadelphia*	3.30c
Pittsburgh(h)	3.30c
Portland	4.35c
San Francisco	4.20c
Seattle	4.35c
St. Louis	3.65c
St. Paul	3.65c
Tulsa	3.55c

HOOPS

Baltimore	2.30c
Boston††	4.40c
Buffalo	3.52c
Chicago	3.40c
Cincinnati	3.57c
Det., No. 14 and lighter	3.49c
Los Angeles	5.95c
Milwaukee	3.51c
New York‡(d)	3.66c
Philadelphia*	3.55c
Pittsburgh(h)	3.80c
Portland	5.70c
San Francisco	6.25c
Seattle	5.70c
St. Louis	3.65c
St. Paul	3.65c

COLD FIN. STEEL

Baltimore (c)	3.88c
Boston*	4.05c
Buffalo (h)	3.70c
Chattanooga*	4.28c
Chicago (h)	3.65c
Cincinnati	3.87c
Cleveland (h)	3.65c
Detroit	3.74c
Los Ang.(f) (d)	6.00c
Milwaukee	3.76c
New Orleans	4.45c
New York‡(d)	3.96c
Philadelphia*	3.91c
Pittsburgh	3.50c
Portland (f) (d)	6.30c
San Fran.(f) (d)	6.10c
Seattle (f) (d)	6.25c
St. Louis	3.90c
St. Paul	4.17c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.245c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.22c
Cleveland (b)	3.00c
Detroit	3.18c
New York‡(d)	3.36c
St. Louis	3.41c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High Speed	59½c
High carbon, high chrome	39c
Oil hardening	23c
Special tool	21c
Extra tool	17¾c
Regular tool	14½c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	65
Cleveland	70
Detroit	70
Milwaukee	70
Pittsburgh	65-5

(a) Under 100 pounds, 60 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 3.25c.

Prices on heavier lines are subject to new quantity differentials: 399 lbs. and less, up 50 cts.; 400 to 3999 lbs., base; 4000 to 7999 lbs., 15 cts., under; 8000 to 14,999 lbs., 25 cts. under; 15,000 to 39,999 lbs., 35 cts. under; 40,000 lbs. and over, 50 cts. under; (except Boston).

‡Domestic steel; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Aug. 20

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports	£ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling	£ s d
PIG IRON					
Foundry, 2.50-3.00 Silicon	$15.69	3 2 6*	$13.89		1 15 0
Basic bessemer	15.69	3 2 6*	11.51		1 9 0
Hematite, Phos. .03-.05	18.86	3 15 0	.....		.....
SEMIFINISHED STEEL					
Billets	$29.49	5 17 6	$18.65		2 7 0
Wire rods, No. 5 gage	44.93	8 19 0	35.73		4 10 0
FINISHED STEEL					
Standard rails	$41.41	8 5 0	$43.67		5 10 0
Merchant bars	1.90c	8 10 0	1.17c		3 5 0
Structural shapes	1.84c	8 5 0	1.11c		3 1 6
Plates, ††¼ in. or 5 mm	1.93c	8 12 6	1.53c		4 5 0
Sheets, black, 24 gage or 0.5 mm	2.24c	10 0 0	2.17c		6 1 0††
Sheets, gal., 24 gage, corr.	2.63c	11 15 0	2.17c		6 1 0
Bands and strips	1.96c	8 15 0	1.43c		4 0 0
Plain wire, base	2.18c	9 15 0	1.89c		5 5 0
Galvanized wire, base	2.58c	11 10 0	2.10c		5 17 6
Wire nails, base	2.69c	12 0 0	1.71c		4 15 0
Tin plate, box 108 lbs.	$ 4.71	0 18 9	.....		.....

British ferromanganese $75 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$18.83	3 15 0(a)	$19.11	290	$15.16	450	$25.36	63
Basic bessemer pig iron	18.83	3 15 0(a)	12.52	190	12.64	375	27.97 (b)	69.50
Furnace coke	5.40	1 1 6	6.85	104	4.13	122	7.65	19
Billets	30.75	6 2 6	30.12	457	19.53	580	38.84	96.50
Standard rails	1.85c	8 5 0	2.01c	671	1.68c	1,100	2.42c	132
Merchant bars	2.09c	9 7 0	1.89c	630	1.06c	700	2.01c	110
Structural shapes	2.10c	9 7 6	1.86c	620	1.06c	700	1.96c	107
Plates, ††¼-in. or 5 mm	2.17c	9 13 9	2.37c	790	1.29c	850	2.32c	127
Sheets, black								
Sheets, galv., corr., 24 ga.	2.69c	12 0 0§	2.39c	800‡	1.45c	925‡	2.64c	144‡
or 0.5 mm	3.14c	14 0 0	3.60c	1,200	2.28c	1,500	6.77c	370
Plain wire	2.18c	9 15 0	3.30c	1,100	1.90c	1,250	3.17c	173
Bands and strips	2.26c	10 2 0	2.21c	735	1.29c	850	2.32c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. a del. Middlesbrough. b hematite. ††Close annealed.

**Gold pound sterling carries a premium of 63.00 per cent over paper sterling.

Bars

Bar Prices, Page 70

Pittsburgh—Contrasted with spotty automotive bar buying during the last two to three weeks, more of these buyers were putting in an appearance through last week. Hot-rolled bar requirements of the cold finishing trade and heavy reinforcing concrete bar demand are actively supplementing orders from railroad car shops, jobbers, and manufacturers of farm implements. Demand for alloy steel bars is holding at its improvement noted two weeks ago.

Cleveland—Requirements of road-making equipment, mine car and nut and bolt manufacturers remain at the high level set during July. Most of the recent tonnage placed is for immediate delivery. Jobbers' stocks are showing a satisfactory turnover and little buying for stock has been done. While nothing definitely has been done on fourth quarter prices there is still talk of a possible increase. The alloy bar market remains active. Requirements for cold-drawn alloy bars from machine tool builders has played no little part in this activity.

Chicago — Heavy miscellaneous specifications for bars continue to be received by mills here, but the let-down in automotive and agricultural implement demand has affected volume as compared with a month ago. Market is strong.

Boston—Buying of steel bars is brisk and with delivery the most important factor consumers are placing business with suppliers not usually serving them. Jobbers are taking increasing orders, indicating their early entry into the market as buyers.

New York—Steel bar requirements continue heavy. In most cases spot or prompt shipment is wanted. Among good buyers of bars at this time are railroads and the car builders. The price continues firm at 1.95c, base Pittsburgh.

Philadelphia—No great activity is shown in bars as far as new orders are concerned, most of the new business being miscellaneous. However deliveries have not improved, and customers generally are beginning to understand that they cannot expect shipments better than three to four weeks. The price continues firm.

Cold Finished

Cold Finished Prices, Page 71

Pittsburgh—Cold-drawn bar orders from automobile manufacturers showed more volume last week and continued to maintain the market at its high point for 1936. For cold-drawn carbon material 2.25c, Pittsburgh is the quotable market on 10,000 to 19,999-pound lots. Moderately good ordering of cold drawn steel is reported from textile machinery manufacturers, jobbers, and makers of office equipment.

Plates

Plate Prices, Page 70

Pittsburgh—Recent bids to the St. Paul engineers for supplying 24 riveted steel pontoons and 70 pieces of 20-inch electric welded steel pipe find Treadwell Construction Co., Midland, Pa., low bidder on 180-day delivery at $72,290. The same engineers have reserved announcement of low Aug. 12 bid on two oil barges requiring 304 tons until appropriations are received.

Cleveland—New orders are light, but well diversified. While most mills have backlogs of only two to three weeks, they are having difficulty because of demand for immediate shipment on most orders. Prices remain firm. Shipments so far this month have exceeded those in the corresponding period of July.

Chicago — Miscellaneous demand is encountered for plates here. Specifying against orders continues in good volume. Considerable railroad business is reported in prospect. Prices are unchanged at 1.95c, Chicago or Gary.

New York—The steel plate market here continues strong at 2.00c base, Coatesville, Pa., equivalent to 2.19c delivered, New York. While new demand is not as active as in June and July, satisfactory specifications are being received against identified tonnages which were quoted before the end of June and which were placed under contract before the end of July, thus giving the buyers the benefit of the former 1.90c price. Efforts of buyers in some cases to have these tonnages increased are are being firmly resisted. Mills continue to have big backlogs and are having difficulty in many cases to give desired spot deliveries. The naval program will require a large tonnage in the aggregate. Requirements of oil companies continue to bring out much tonnage. Plate makers expect, as the year advances, that a continuously larger tonnage will be required for construction and repair of railroad cars and locomotives. Some large car and locomotive orders are expected to be placed in the fall.

Philadelphia—The plate market is quiet and inquiry is dull. Considerable speculation is being done as to business likely to be developed by the new navy building program. There is no change in deliveries. A diversity of opinion exists regarding the possibility of marked increases in fourth quarter prices.

San Francisco—The only plate award of size went to United Concrete Pipe Co., Torrance, Calif., for liner plates for a large diameter precast reinforced concrete pipe line for the metropolitan water district, Los Angeles. Bookings so far this year are nearly double the tonnage placed during all of 1935. To date 101,661 tons have been placed, compared with only 24,392 tons for the same period a year ago. Bids open on Aug. 27 for the Hayfield pumping plant for the metropolitan water district, Los Angeles, requiring close to 1000 tons of plates.

Seattle—Industrial demand is increasing and estimators are busy on new specifications, mostly from industrial sources. For purifying tanks and a pipe line for the Soundview Pulp Co. improvement, Everett, Wash., 155 tons are involved. Hydraulic Supply Mfg. Co., Seattle, took the tank contract, 80 tons, and Steel Tank & Pipe Co., Portland, the water pipe job, 75 tons. Clifton-Applegate Co. has the contract for siphons for a state irrigation project at Flint, Creek, Mont. Seward, Alaska, opens bids Oct. 12 for a hydro-electric project involving a steel pipeline, 5180 feet long.

Contracts Placed

3500 tons, liner plates for 9-foot 8-inch precast reinforced concrete pipe for metropolitan water district, Los Angeles, to United Concrete Pipe Co., Torrance, Calif.

260 tons, standpipe, Greenbelt, Md., to Pittsburgh-Des Moines Steel Co., Pittsburgh, for Washington suburban sanitary district.

250 tons, tanks, Pepsi Cola Co., Long Island City, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

155 tons, tanks and pipe line for Soundview Pulp Co., Everett, Wash., to Hydraulic Supply Mfg. Co., Seattle, and Steel Tank & Pipe Co., Portland, Oreg.

Contracts Pending

400 tons, 24 riveted steel pontoons and 70 pieces of 20-inch electric welded steel pipe for St. Paul engineers; Treadwell Construction Co., Midland, Pa., low on 180-day delivery at $72,290; second low, Ingalls Iron Works, Birmingham, Ala., $79,140.

Unstated, siphons for state irrigation project, Flint Creek, Mont.; general contract to Clifton-Applegate Co.

Unstated, 5180 feet pipe line, power plant for Seward, Alaska; bids by town clerk Oct. 12.

Tin Plate

Tin Plate Prices, Page 70

Pittsburgh—Although operating at actual capacity, tin plate producers are not able to deplete backlogs ap-

preciably. The market is unchanged on the basis of an official $5.25 base price, f.o.b. Pittsburgh, for standard tin plate, but a number of tin plate producers and consumers alike have been revising plate contracts to conform with the Robinson-Patman act. Pittsburgh Brewing Co., Pittsburgh, has signed a long-term contract with the National Can Co., subsidiary of the McKeesport Tin Plate Co., McKeesport, Pa., covering the former's requirements of beer cans. The brewing company has an annual capacity of around 500,000 barrels.

Sheets

Sheet Prices, Page 70

Pittsburgh—The $2 per ton advance in electrical sheets which ostensibly becomes effective for fourth quarter, has not yet been followed by increases in other sheets. Considerable market discussion is heard of a higher fourth-quarter market in all grades of sheets. Orders last week were diversified, including attractive export specifications.

Cleveland—Bookings have tapered off in contrast to the strong demand the first half of the month. This will afford an opportunity for mills to cut down backlogs of four weeks on hot-rolled and six weeks on cold-rolled. The rumored price increase, especially in electrical and galvanized sheets, has not as yet been announced. While there has been a noticeable decline in requirements of auto and farm equipment manufacturers, demand from household utilities concerns has held up better than expected.

Chicago—Deliveries continue deferred from four to six weeks. Automobile demand is reviving and is expected to show steady improvement from now on. While there is some talk of a possible price increase for fourth quarter, no step has been taken in this direction.

Boston — Sheet demand is improving after a brief lull with numerous attractive orders placed last week, usually for prompt shipment.

New York—Sheet demand in this territory continues lively. Consumers did not buy nearly enough in June to take care of their third-quarter requirements. In July they bought because of the threat of labor trouble in the steel industry, but requirements increased and absorbed the additional tonnage ordered. The volume of new business here in August is regarded as being at least 200 per cent higher than the volume of last August. Many mills are sold at least four weeks ahead. Hot-rolled sheets usually can be had without much difficulty, but it is more difficult to get early delivery on sheets which require more extensive mill processing. Jobbers have depleted their sheet inventories to an extent which makes it appear certain that there will be substantial buying by these interests early in September.

Philadelphia—Although large new tonnages were unusual here last week, the sheet market is much more active than customarily at this season. In most cases spot shipment is wanted. There is a lessening of excitement over the delivery situation, but this is not due to any improvement in delivery dates. It is because customers have found that the situation affects all mills.

Cincinnati—Delivery of sheets to automobile manufacturers is up slightly and miscellaneous demand is steady. District demand is 85 to 90 per cent of capacity, even though steelmaking operations are rated as only 76 per cent. Steady buying for household equipment has been countra-seasonal. Electrical sheets will advance $2 a ton, effective the next quarter, according to announcement of American Rolling Mill Co.

St. Louis—Sheet shipments continue at the high level of several months, despite which fact, backlogs are still heavy. New buying is in fair volume, though showing some recession compared with July. Stove, refrigeration, household appliance and air conditioning interests account for relatively heaviest tonnages. Railroad equipment builders have fairly well covered their immediate requirements, but are expected to be back in the market in a big way before the end of September.

Birmingham, Ala.—Mills maintain active production. Demand is good with numerous inquiries. It is expected that requirements will result in steady production indefinitely.

Pipe

Pipe Prices, Page 71

Pittsburgh—The 92-mile, 14-inch gas pipe line for the Godfrey Cabot Co., Boston, still is delayed from the contract stage. Bids will be opened Sept. 4 by the Louisville, Ky., engineers on 4690 lineal feet of electric-weld dredge pipe, having an inside diameter of 24 inches. Pipe will be in sixty 60-foot sections of discharge pipe and 72, 15-foot, 2-inch sections of shore pipe. All discounts on tubular products are holding.

Cleveland—Standard pipe requirements continue strong, most tonnage going into industrial extensions and repairs. Large orders have been noticeably absent, but total miscellaneous tonnage continues at the rapid pace set through July. Jobbers' stocks are moving fast and little, if any, buying for stock has been noticed.

Chicago—The market has quieted down considerably, and few projects are pending. Three thousand tons for the city of Chicago was closed Aug. 18, the tonnage being divided between the U. S. Pipe Foundry Co., Burlington, N. J., and the Lynchburg Foundry Co., Lynchburg, Va.

New York—The most important business in the cast pipe market in some time was placed last week. It involved 5300 tons for the department of purchase, New York, and was distributed to five manufacturers. Other lettings involved a total of about 1000 tons. Considerable business involving 3000 to 5000 tons is pending. Volume of merchant pipe business continues heavy. As a result, the price situation in the secondary market is the firmest in a long time. The outlook in merchant pipe is favorable, owing to activity in the building industry.

Birmingham, Ala.—Cast pipe shops are quite active, operating from three to five days a week. Central Foundry Co., plant at Anniston, Ala., manufacturing sanitary pipe and fittings, has been opened again after seven years' idleness.

San Francisco—Demand for cast pipe in the Pacific coast markets is again at low ebb and awards are in less than carload lots. The United States department of interior has just taken bids on 255 tons of 6-inch cast iron or asbestos cement pipe.

Seattle—Business continues slow with few important projects pending.

Cast Pipe Placed

5300 tons, various borough yards, New York city, to United States Pipe & Foundry Co., Burlington, N. J.; Warren Foundry & Pipe Corp., Phillipsburg, N. J.; Donaldson Iron Co., Emaus, Pa.; R. D. Wood & Co., Florence, N. J.; and Central Foundry Co., Birmingham, Ala.

3000 tons, city of Chicago, to U. S. Pipe & Foundry Co., Burlington, N. J., and Lynchburg Foundry Co., Lynchburg, Va.

500 tons, 4, 6 and 8-inch, Public Service Corp. of New Jersey, Newark, N. J., to United States Pipe & Foundry Co., Burlington, N. J.

200 tons, 6 and 8-inch, Public Service Corp. of New Jersey, Newark, N. J., to Warren Foundry & Pipe Corp., Phillipsburg, N. J.

150 tons, 4, 6 and 8-inch, Random Lake, Wis., to James B. Clow & Son, Chicago.

100 tons, 30-inch class B, Freeport, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

400 tons, Westchester sanitary sewer commission, White Plains, N. Y.

165 tons, state hospital, King's Park, N. Y.

100 tons, Yonkers, N. Y.

—The Market Week—

Transportation

Track Material Prices, Page 71

Although rail mills and freight car builders have fairly heavy backlogs against which they are working at a good rate new business is scarce and consists of small lots. Prospects for further buying of rails and cars during the fall are excellent and present orders are likely to be supplemented by sufficient new orders to assure activity through the year.

Buying of track accessories has been in good volume and with an advance of $2 per ton applying today on all material not specified at the end of last week. Considerable tonnage was specified in recent weeks.

Monongahela Connecting railroad, a subsidiary of Jones & Laughlin Steel Corp., Pittsburgh, has awarded 1000 tons of rails to Carnegie-Illinois Steel Corp., Pittsburgh.

Inquiries are expected soon from the New York Central for 50 locomotives, from the Southern Pacific for 35 and from the Boston & Maine for an indefinite number. The latter is expected to buy a considerable number of cars soon.

No action has been taken on an inquiry by the United Fruit Co., for 10 narrow gage mikado-type locomotives for International Railways of Central America nor on the inquiries by the Rio Grande do Sul of Brazil for 10 locomotives and 300 to 400 freight cars.

United States Engineer, Fort Peck, Mont., takes bids Aug. 25 for construction of 14 miles of railroad to Snake Butte quarry, to be completed April 1, 1937. Project involves laying 82,855 feet of track, 100 tons of shapes and a steel span over Milk river.

Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., schedules 2250 tons of rails for rolling between Sunday night and Wednesday night, to catch up on its backlog.

Rail Orders Placed

Monongahela Connecting Railroad Co., 1000 tons to Carnegie-Illinois Steel Corp.

Car Orders Pending

Missouri Pacific, 200 sheathed box cars, 40-ton capacity, for Gulf Coast lines.

Northern Pacific, 500 gondolas, 250 flats and 250 stock cars, all 50-ton capacity; permission asked of interstate commerce commission.

Locomotives Pending

Northern Pacific, 12 four-cylinder locomotives; permission asked of interstate commerce commission.

Buses Booked

American Car & Foundry Motors Co.,

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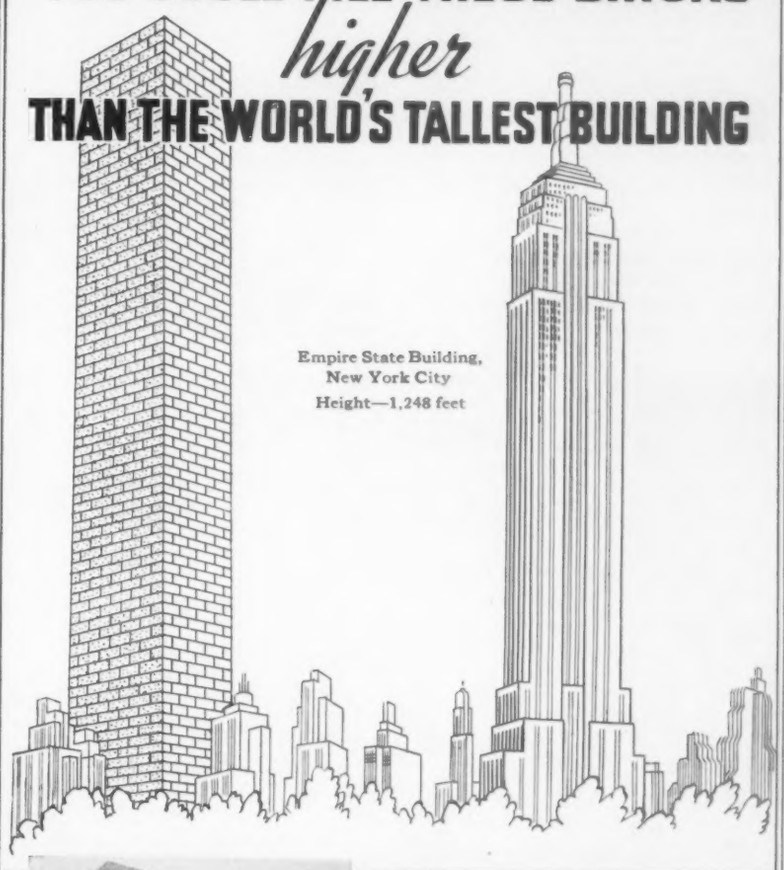
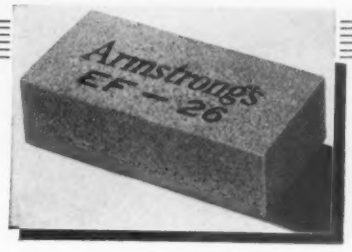


Empire State Building, New York City
Height—1,248 feet



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New York: 18 coaches for Eastern Massachusetts Street Railway Co., Boston; four coaches for Houston Electric Co., Houston, Tex.; ten for Worcester Street Railway Co., Worcester, Mass.; 14 for Connecticut Co., New Haven, Conn.; General Motors and Twin Coach Co., Kent, O., 27 coaches for Connecticut Co.

J. G. Brill Co., Philadelphia: 7 buses for Shreveport Railways Co., Shreveport, La.; 32 trolley buses for Louisville Railway Co., Louisville, Ky.; 57 trolley buses for Indianapolis Railways, Indianapolis.

Reliable Remover & Lacquer Corp., 42-56 Crescent street, Long Island City, New York, recently organized, has installed complete equipment for manufacture of paints and lacquers, including a line for the finishing of metal products.

Strip

Strip Prices, Page 71

Pittsburgh — Requests for more prompt shipment have accompanied the more liberal orders of automobile parts manufacturers for both hot and cold-rolled strip over the past week, resulting in a moderate stepup in mill operations which are now at about 70 per cent of capacity. Many miscellaneous users are also participants on frequent occasions in the present market. The Pittsburgh base price of hot-rolled strip remains 1.95c and on cold-rolled, 2.60c, either Pittsburgh or Cleveland base.

Cleveland — While new business has declined slightly, as was anticipated because of the expected tapering off in requirements from automobile partsmakers. This recession has given many mills, who have been running close to capacity, an opportunity to clear up backlogs on hot-rolled, on which delivery is now approximately two weeks, while on cold-rolled it is a month. Of the recent tonnage placed narrow widths were in greatest demand, most of it coming from electrical equipment manufacturers for immediate delivery.

Chicago—Sellers are booking new business steadily from large miscellaneous consumers. Automotive demand is off, but shows signs of quickening. The market is firm and there is some talk of a probable price advance for the fourth quarter.

New York—Consumption of both hot and cold-rolled continues active. Fair business in hot strip has been placed at 1.95c, base, Pittsburgh. Cold rollers are having trouble in many cases in making delivery dates.

Philadelphia—Although consumption is at a high rate, new business in hot and cold-rolled strip is small at present. Prices are firm.

Wire

Wire Prices, Page 71

Pittsburgh—Well-diversified demand for merchant wire products continues a highlight although prices, especially on nails, are subject to considerable irregularity. The official market of $2.10 per keg, f.o.b. Pittsburgh or Cleveland, on standard wire nails has been more widely subjected, especially through the East, to prices as low as $1.90. Specialty wire items show considerably more price stability.

Cleveland—No let up in the demand for merchant and manufacturing wire has occurred so far this month. Tonnage is as good as in the corresponding period during the peak month of July. Backlogs remain extended to three or four weeks. Many consumers are coming into the market for greater tonnages than normally, because of delayed delivery and anticipated increase in demand this fall. Prices are firm and no cutting has occurred for some time. Talk still persists of a possible increase this fall.

Chicago—The effects of the drought are being reflected to some extent in wire and wire products but

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miscellaneous demand is holding up exceptionally well. New business is largely for spot delivery which cannot be given. Shipments are deferred from three to four weeks. Easiness persists in prices, but indications are an effort will be made to put the market on a stable basis for fourth quarter.

New York—Steel nails continues the only factor of weakness in the wire market. Manufacturers' wire continues in good demand and while mills are sold up they are having relatively little difficulty in taking care of requirements.

Philadelphia—No change has developed in wire nails, $1.90 being quoted freely. All other wire products seem to be holding firm in price.

Shapes

Structural Shape Prices, Page 70

New York—While lettings aggregated about 2500 tons, a large amount of tonnage is under negotiation for early closing. Pending list has been swelled noticeably by an inquiry for another west side elevated highway extension here, to require about 6000 tons. The market on plain structural material continues firm at 2.00c base, Bethlehem, Pa.

Pittsburgh—Inquiry is led by the General Motors Corp. job closing Aug. 28, involving approximately 10,000 tons for a new plant, office building, and loading dock at Elizabeth, N. J. The Youngstown Sheet & Tube Co., Youngstown, O., is taking bids Aug. 27 on a 300-foot extension to its strip mill at Campbell, O., and Pittsburgh Steel Co., Pittsburgh, is now tabulating bids on the new additions to the Monessen, Pa., and Allenport, Pa., divisions. Plain structural shapes are quoted unchanged at 1.90c, base, Pittsburgh.

Cleveland—Fabricators are having difficulty in obtaining steel from mills. In view of the fact that many have jobs on their books to keep them busy for at least two months, this condition has hindered them in completing their own delivery schedules. Total tonnage placed this month has increased over the corresponding period in July. Far greater portion of the contracts placed is for public projects, but there have been several private jobs of 100 tons or less, for plant extensions and the like.

Chicago—A large number of small miscellaneous tonnages have been placed and total tonnage pending encourages sellers to look for an active fall. Included in pending tonnages are 4953 tons for a dam at Saberton, Mo., of which total 1828 tons are sheet piling and 550 tons, concrete bars. Massman Construction Co., Kansas City, Mo., is reported low bidder on this project.

Boston—While awards recently have been small, approximately 8000 to 10,000 tons are under negotiations for early closing. In the meantime, all shops show signs of steady activity. Plain structurals continue firm at 2.00c base, Bethlehem, Pa.

St. Louis — Contracts totaling $360,000 have been let for an overpass over the Illinois terminal railway tracks at Venice, Ill. The struc-

Shape Awards Compared

	Tons
Week ended Aug. 21	31,418
Week ended Aug. 14	22,628
Week ended Aug. 7	28,125
This week, 1935	13,808
Weekly average, 1935	17,081
Weekly average, 1936	22,794
Weekly average, July	27,757
Total to date, 1935	524,696
Total to date, 1936	775,006

As farm power machinery is developed for greater capacities and harder working conditions, there is an ever increasing demand for sturdier steels—to provide maximum strength with minimum weight.

B & L Cold Finished Steel is fully meeting these requirements, not only in the manufacture of implements and tractors, but also in building automobiles and trucks, road machinery and many other heavy-duty types of equipment.

Year after year, machine manufacturers are using steadily increasing tonnages of B & L Cold Drawn Steel—for axles and shafts, rods and gears, wear-resisting members and machine parts.

Whatever type of equipment you make, B & L prime quality Steels, both carbon and alloy grades, will enable you to build better running qualities and more enduring service into your machines.

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ture is being built with part of the $3,300,000 alloted to the East St. Louis district, as a federal grade crossing elimination program. For this job, Illinois Structural Bridge Co., Jacksonville, Ill., was awarded contract for fabricating structural. Contract calling for 88 tons of reinforcing bars was taken by Maurice Hoeffken & Co., Belleville, Ill., for $85,360.

San Francisco—Awards aggregated less than 2000 tons and brought the total for the year to 128,234 tons as compared with only 68,811 tons for the corresponding period in 1935. Bethlehem Steel Co., Bethlehem, Pa., took 275 tons for the Budlong avenue school, Los Angeles, and Pacific Iron & Steel Co. was awarded 250 tons for a 4-story building in Los Angeles. Bids open Sept. 15 for 10,000 to 12,000 tons for the Union station, Los Angeles.

Seattle—Awards were not outstanding but important projects are developing. Fabricating plants are well supplied with work. Phillips & Davies, Kenton, O., was awarded an unstated tonnage of gates, hoists and cranes for the Spokane, Wash., pumping plant. Unstated interests have taken 165 tons for a state crossing at Dover, Idaho.

Thirteen BROSIUS

Two Motor Electric Mechanical Clay Guns have been sold since the first installation was made in 1934 . . . *Nine* of them since January 1st, this year.

Stopping under full wind pressure continuously is standard practice with this gun, and, if necessary, the hole can be stopped with iron flowing full.

The operation of the gun is controlled entirely from a remote control station, away from all danger. No clamping mechanism is used, the gun being pulled into the hole by a flat wire rope attached to the furnace front and a non-reversing (except by motor) winch in the end of the boom.

A nine cubic foot clay barrel provides ample clay to stop any hole, eliminating the necessity of adding clay to the barrel during the plugging operation.

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Shape Contracts Placed

6200 tons, Sixth avenue subway, section 9, West Thirty-third to West Fortieth street, New York, to Bethlehem Steel Co., Bethlehem, Pa.

3300 tons, transmission towers, Pickwick dam, Memphis, Tenn., to American Bridge Co., Pittsburgh.

2600 tons, building for Owens-Illinois Glass Co., Oakland, Calif., to Moore Drydock Co., San Francisco.

1400 tons, dam No. 12, Bellevue, Iowa, to Treadwell Construction Co., Midland, Pa., through Warner Construction Co., Chicago. This is in addition to the 2600 tons previously reported.

1180 tons, bridge, Madison county, Illinois, to Illinois Steel Bridge Co., Jacksonville, Ill.

1177 tons, overpass on Broadway over Illinois terminal tracks, Venice, Ill., to Illinois Structural Bridge Co., Jacksonville, Ill.,

1100 tons, two hangars for San Francisco bay exhibition, to Judson-Pacific Co., San Francisco.

1020 tons, butterfly sheds, Union terminal, Los Angeles, Calif., to Consolidated Steel Corp., Los Angeles.

1000 tons, state highway bridge, Joliet, Ill., to Bethlehem Steel Co., Bethlehem, Pa.

1000 tons, Little Hell Gate approach, Triboro bridge authority, New York, to American Bridge Co., Pittsburgh.

970 tons, Triboro lower level bridge, Randalls Island—Wards Island, New York, to American Bridge Co., Pittsburgh.

965 tons, bridge, WPGM 859-A, Dallas county, Texas, to Mosher Steel & Machinery Co., Dallas, Tex.

535 tons, coal tipple, Harrisburg, Saline county, Illinois, to Pan-American Bridge Co., New Castle, Ind.

525 tons, building for Reynolds Spring Co., Jackson, Mich., to the Austin Co., Cleveland.

500 tons, blast furnace repairs, Detroit, to John Mohr & Sons, Chicago.

400 tons, plant for Acme Can Co., Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

335 tons, Silver Springs bridge, Milwaukee, to Milwaukee Bridge Co., Milwaukee.

320 tons, bridge for New York Central railroad, Whitesboro, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

310 tons, bridge repairs, Nickel Plate railroad, Warren, Ind., to American Bridge Co., Pittsburgh.

300 tons, bridge, Delaware county, Indiana, to Fort Pitt Bridge Works, Pittsburgh.

300 tons, state bridge, Hightstown, N. J., to Bethlehem Steel Co., Bethlehem, Pa., through Kolyn Construction Co., Trenton, N. J.

290 tons, state highway bridge, New Goshen, Ind., to Vincennes Bridge Co., Vincennes, Ind.

282 tons, Overland avenue bridge for United States engineer office, Los Angeles, to Minneapolis-Moline Power Implement Co., Minneapolis.

275 tons, Budlong avenue school, Los Angeles, to Bethlehem Steel Co., Bethlehem, Pa.

275 tons, bridge, 1378, Vigo county,

Indiana, to Fort Pitt Bridge Works, Pittsburgh.

275 tons, bridge, Vigo county, Indiana, to Insley Mfg. Co., Salisbury, Md.

260 tons, bridge, 169 B section 125 SC, Lake county, Illinois, to American Bridge Co., Pittsburgh.

250 tons, building, 9544 Wilshire boulevard, Los Angeles, to Pacific Iron & Steel Co., Los Angeles.

245 tons, Port Washington bridge, Milwaukee, to Milwaukee Bridge Co., Milwaukee.

220 tons, underpass, Green river, Wyoming, to Omaha Steel Works, Omaha, Nebr.

215 tons, Coca Cola Co. building, 525 East Nineteenth street, New York, to F. G. Schaefer Iron Works, Edgewater, N. J., through H. Craig Severance, New York.

205 tons, bridge section, 8C Perry, Washington county, Illinois, to Missouri Bridge & Iron Co., St. Louis.

200 tons, plant addition, Detroit, to R. C. Mahon Co., Detroit.

200 tons, McKee masonic building, Elizabethtown, Pa., to Bethlehem Fabricators Inc., Bethlehem, Pa.

200 tons, garage for Stewart Realty Co., Baltimore, to Dietrich Brothers, Baltimore.

200 tons, boiler house extension, Shell Oil Co., Los Angeles, to Bethlehem Steel Co., Bethlehem, Pa.

190 tons, bridge, Seneca county, New York, for Lehigh Valley railroad, to Bethlehem Steel Co., Bethlehem, Pa.

170 tons, addition to museum of art, Baltimore, to Bethlehem Steel Co., Bethlehem, Pa.

165 tons, bridge 169 C section 125 SF, Lake county, Illinois, to Gage Structural Steel Co., Chicago.

165 tons, state crossing Dover, Idaho, to unnamed interest; A. B. Carscallen, general contractor.

165 tons, school building, New Berlin, N. Y., to Utica Steam Engine & Boiler Works, Utica, N. Y.

160 tons, state bridge, Emenston, Wyo., to American Bridge Co., Pittsburgh.

160 tons, steel roof deck, four double hangars, Hickman Field, T. H., to United States Gypsum Co., Chicago.

150 tons, state bridge, Concord, N. H., to Boston Bridge Works Inc., Cambridge, Mass., through Central Construction Co., Lawrence, Mass.

140 tons, state bridge RC 3768, Franklin county, New York, to Lackawanna Steel Construction Co., Buffalo, through Belmar Construction Co. Inc.

135 tons, manufacturing building, J. C. Dunn Co., Camden, N. J., to Belmont Iron Works, Eddystone, Pa.

130 tons, 320-foot span, Lucas county, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

125 tons, substructure for Ashland avenue bridge, Chicago, to Gage Structural Steel Co., Chicago.

125 tons, addition to United States Spring & Bumper Co., Los Angeles, to Bethlehem Steel Co., Bethlehem, Pa.

110 tons, building addition, Rohm & Haas, Philadelphia, to Frank M. Weaver & Co., Inc., Lansdale, Pa.

105 tons, bridge No. 5509, Fillmore county, Minnesota, to American Bridge Co., Pittsburgh.

104 tons, crossings in Adams and in Whitman county, Washington, to unnamed interest.

100 tons, H-piling for Cowen park bridge, Seattle, to Bethlehem Steel Co., Seattle.

Shape Contracts Pending

10,000 to 12,000 tons, Union station, Los Angeles; bids Sept. 15.

10,000 tons, plant building, loading dock, and office building, Elizabeth, N. J., for General Motors Corp., Detroit; bids Aug. 28.

6000 tons, west side elevated highway extension, Ninety-eighth to 111th streets, New York; bids Sept. 11.

4953 tons, dam No. 2, Saberton, Mo.; Massman Construction Co., Kansas City, Mo., low.

4000 tons, chronic disease hospital building for Welfare Island, New York.

3500 tons, federal building, Cincinnati; general contract to Great Lakes Construction Co., Chicago; reinforcing steel requirements, 600 tons.

2000 tons, armory building, Teaneck, N. J.; bids Sept. 14.

1384 tons, three truss bridges and one underpass, Erie, Juniata, Lancaster and Tioga counties, Pennsylvania; bids to state highway department, Sept. 4; included, 212 tons plain steel bars.

1000 tons, boiler house and train shed for Commonwealth Edison Co., Chicago.

1000 tons, relocation of Baltimore & Ohio railroad tracks, East Sparta, O.; bids to army engineers, Zanesville, O., Sept. 10.

850 tons, aggregate for a number of bridge spans, Pennsylvania depart-

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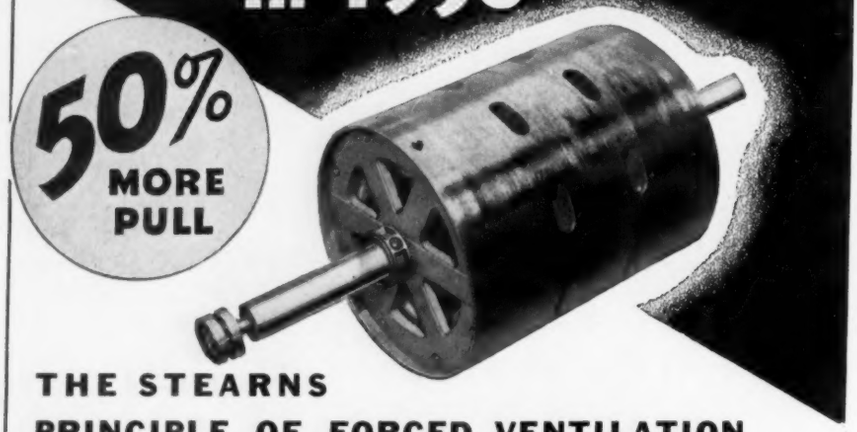
NEW YORK — CHICAGO — PHILADELPHIA — DETROIT — CLEVELAND

ment of highways, Harrisburg, Pa.; bids Aug. 28.
800 tons, Gordon Baking Co. building, Long Island City, N. Y.; general contract to Best & McCaffrey, New York.
800 tons, plaza construction, Midtown-Hudson tunnel, Weehawken, N. J.; bids Sept. 8.
600 tons, four state highway bridges, New York.
600 tons, Keeshin terminal warehouse, revised tonnage from 1000.
500 tons, bridge, Butler, Ky., for Kentucky state highway department, including 120 tons reinforcing bars; bids Aug. 28.
475 tons, bridge, Monson, Mass.
465 tons, state highway bridge, Long Eddy, New York; low bidder, Howes & Farrell, Delhi, N. Y.
440 tons, addition to Du Pont Co. plant, Niagara Falls, N. Y.
303 tons, Carson Estate, Dominguez Estate and Centinella avenue bridges, United States engineer office, Los Angeles; bids opened.
300 tons, administration building, state reformatory, Elmira, N. Y.
300 tons, extension of strip mill, Campbell, O., for Youngstown Sheet & Tube Co., Youngstown, O.; bids Aug. 27.
300 tons, state bridge, Hampshire county, West Virginia; Fort Pitt Bridge Works, Pittsburgh, low on Aug. 18 bids.
240 tons, Long Island railroad grade crossing elimination, Smithtown, N. Y.; low bidder, Tully & Di Napoli, Long Island City, N. Y.
236 tons, plate girder overpass bridge, McKean county, Pennsylvania; A. M. White Inc., Lebanon, Pa., general contractor; included, 70 tons bars.
200 tons, Lenox Hill hospital addition, New York.
180 tons, addition to Plaza hotel, Washington.
175 tons, high school, Dover, N. J.
145 tons, overpass, Mansfield, Mass.
140 tons, plate girder overpass bridge, Armstrong county, Pennsylvania; Connell & Laub, Coshocton, O., general contractor.
135 tons, steel sheet piling, superintendent of lighthouses, Milwaukee; bids Aug. 31.
133 tons, crossing, Las Vegas, Nev.; bids Aug. 28.
130 tons, state highway bridge, Metuchen, N. J.; low bidder, Yeomans-Drews Co., Jersey City, N. J.
115 tons, post office, jail and court house, Ketichan, Alaska; new bids Sept. 3.
100 tons, Edes Falls bridge, Naples, Cumberland county, Maine.
100 tons, building, United States navy yard, Brooklyn, N. Y.; Phoenix Bridge Co., Phoenixville, Pa., low bidder.
Unstated tonnage, manufacturing addition, J. G. Brill Co., Philadelphia.
Unstated tonnage, Root river bascule bridge, Racine, Wis.; PWA grant applied for.
Unstated tonnage, gates, crane, hoists, etc, for Spokane pumping plant; Phillips & Davies, Kenton, O., general contractor.

REVOLUTIONARY in 1917 UNIVERSALLY RECOGNIZED in 1936



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HIGH DUTY STEARNS MAGNETIC EQUIPMENT

STEARNS MAGNETIC MFG. CO.
650 S. 28th St., Milwaukee, Wis.

Reinforcing

Reinforcing Bar Prices, Page 71

New York—Lettings aggregated about 1500 tons, of which approximately 900 tons are to be used in connection with New Jersey state highway work. A large amount of tonnage continues under negotiation with early closing. The price situation continues unsatisfactory. While 2.05c base, Pittsburgh, is the usual price on small lots this figure continues to be shaded materially.

Pittsburgh—Present plans of J. F. Finch & Co. to build a second warehouse at the Schenley Distillery, Armstrong county, Pennsylvania, at a cost of about $4000 will require about 700 tons. Low bidders have been announced on the Aug. 18 letting in West Virginia work: T. A. Loving,

Concrete Awards Compared

	Tons
Week ended Aug. 21	7,720
Week ended Aug. 14	8,216
Week ended Aug. 7	4,723
This week, 1935	2,538
Weekly average, 1935	6,862
Weekly average, 1936	6,753
Weekly average July	8,510
Total to date, 1935	149,427
Total to date, 1936	229,593

Goldsboro, N. C., is low on work at Bluefield, W. Va., taking 283 tons, C. C. Dodds, Spencer, W. Va., on 83 tons, A. M. Campbell, Lynchburg, Va., on 78 tons, and Pocahontas Construction Co., Cass, W. Va., on 67 tons. The market is quoted officially at 2.05c, base, Pittsburgh, but price shading continues reported.

Cleveland—New tonnage has been scarce and little has been placed from private sources; most of it is going into public projects for road repair work, bridges and the like. Bids are out for the easterly sewage contract No. 91, involving between 200 and 250 tons, bids Sept. 3. Prices remain firm on both billet and rail steel. Most mills are running close to capacity in an effort to clear up backlogs.

Chicago—A large volume of small tonnages ranging up to 100 tons is keeping sellers busy. Private work is reported increasing. Prices are unchanged, though some concern is expressed over the fact that certain jobbers are offering material under the quoted market.

Boston—Brisk business and heavy awards featured the market. Among pending jobs is the housing project in Cambridge, Mass., involving 1000 tons. While the market is quoted at 2.10c base, Buffalo, this has been shaded.

Philadelphia—Little new business came out, most of the orders being for small quantities. The Hill Creek housing order has not been let by the contractor as yet. There was no further announcement about the Camden, N. J., housing job.

San Francisco—An active market brought the aggregate for the year to 167,481 tons as compared with 77,935 tons for the corresponding period in 1935. United Concrete Pipe Co. was awarded 3515 tons for a 9-foot 8-inch precast pipe line for the metropolitan water district, Los Angeles. Bids have just been opened on two projects in Los Angeles for the Treasury department calling for 559 tons.

Seattle—Local mills have larger backlogs, and new business is being placed, much of it coming from jobbers and in small tonnages. Largest award, 600 tons for the addition to the Soundview Pulp Co. plant, Everett, Wash., was taken by Bethlehem Steel Co. Considerable tonnage has been sold to Oregon interests for highway and construction jobs. Business pending includes 400 tons for the Grassy lake project, Idaho, on which bids were opened Aug. 7.

Reinforcing Steel Awards

3500 tons, 9-foot 8-inch precast reinforced concrete pipe, metropolitan water district, Los Angeles, to United Concrete Pipe Co., Torrance, Calif.

600 tons, addition to Soundview Pulp Co. plant, Everett, Wash.; to Bethlehem Steel Co., Seattle.

500 tons, miscellaneous construction and highway projects in Oregon, Washington and Idaho, to unnamed interests.

350 tons, New Jersey state highway, route 23, section 10, to Stulz-Sickles Co., Newark, N. J., through Lafera-Grecco, Newark.

250 tons, New Jersey state highway, route 44, sections 2-A, 4-A and 7 to Bethlehem Steel Co., Bethlehem, Pa., through Charles D. Prosser, Pitman, N. J.

210 tons, overpass on Broadway over Illinois Terminal railway tracks, Venice, Ill.; 88 tons to Maurice Hoeffken Co., Belleville, Ill., and 130 tons to Madison Construction Co., Edwardsville, Ill.

200 tons, Pennsylvania railroad work, Newark, N. J., to Joseph T. Ryerson & Son Inc., Chicago, and Igoe Bros., Newark, through J. Rich Steers Inc., New York.

200 tons, road work, Wallingford, Vt., to Northern Steel Co., Medford, Mass., through Lane Construction Co., Meriden, Conn.

200 tons, road work, Barton-Irasburg, Vt., to Northern Steel Co., Medford, Mass.

185 tons, Triboro bridge, contract 73, New York, to Igoe Bros., Newark, N. J., through Mead Engineering Co., New York.

180 tons, Budlong avenue school, Los

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Steel Sales Corp.
129 South Jefferson St.
Chicago

H. L. Brown
2001 Carew Tower
Cincinnati

Angeles, to unnamed interest.
175 tons, generator building for Twentieth Century-Fox Film Corp., Los Angeles, to unnamed interest.
150 tons, church, 4136 West Washington boulevard, Los Angeles, to unnamed interest.
130 tons, Dole Valve Co., Chicago, to Calumet Steel Co., Chicago.
125 tons, school gymnasium, Inglewood, Calif., to unnamed interest.
125 tons, grade crossing, Mansfield, Mass., to Joseph T. Ryerson & Son Inc., Chicago, through Coleman Bros. Corp., Boston.
120 tons, store, 9544 Wilshire boulevard, Los Angeles, to unnamed interest.
120 tons, crossing, Green river, Sweetwater county, Wyoming, to unnamed interest.
110 tons, Thirty-seventh street school, Los Angeles, to Blue Diamond Corp., Los Angeles.
100 tons, factory building for E. I. du Pont de Nemours & Co., Wilmington, Del., to Turner Construction Co., New York.
100 tons, store, Pacific avenue and Zoe street, Huntington Park, Calif., to unnamed interest.
100 tons, bridge, Concord, N. H., to Truscon Steel Co., Youngstown, O., through Central Construction Co., Lawrence, Mass.
100 tons, grade crossing, Peabody-Saugus, Mass., to Concrete Steel Co., New York, through Richard White & Sons Co., West Newton, Mass.
100 tons, Armour & Co. building, Boston, to Joseph T. Ryerson & Son Inc., Chicago, through Tredennick-Billings Co., Boston.

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Reinforcing Steel Pending

1700 tons, Lathrop housing project, Chicago.
1000 tons, housing project, Cambridge, Mass.; John Bowen, Boston, low.
700 tons, warehouse, Armstrong county, Pennsylvania for Schenley Distillers Corp., New York.
436 tons, new warehouse for Colgate-Palmolive-Peet Co., Chicago.
400 tons, Grassy lake reclamation project, Idaho; bids in at Ashton, Idaho.
300 tons, west side elevated highway extension, Ninety-eighth to 111th street, New York; bids Sept. 1.
283 tons, state bridge, Bluefield, W. Va.; T. A. Loving Co., Goldsboro, N. C., low on Aug. 18 letting.
282 tons, 3 West Virginia state highway projects in Aug. 18 letting as follows: 83 tons, Preston county, C. C. C. Dodds, Spencer, W. Va., low; 78 tons, Harper county, A. M. Campbell, Lynchburg, Va., low; 67 tons, Smithers Creek, Pocahontas Construction Co., Cass, W. Va., low.
250 tons, Washington state highway projects; bids at Olympia, Wash., Sept. 1.
220 tons, bridge at Louisville for Kentucky state highway department; bids Aug. 28.
175 tons, post office, jail and courthouse, Ketichan, Alaska; new bids Sept. 3.
170 tons, store, Oak Park, Ill.
167 tons, crossing near Fife, Pierce county, Washington; bids Sept. 1.
167 tons, crossing in Las Vegas, Nev.; bids Aug. 28.
112 tons, bridge, Monson, Mass.
104 tons, plate girder overpass bridge, Armstrong county, Pennsylvania; Connell & Laub, Coshocton, O., general contractor.
Unstated tonnage, concrete stoplogs for Bonneville dam, Oregon; Collins Concrete & Steel Pipe Co., Portland, Oreg., general contractor.
Unstated tonnage, state span, Blackfoot river, Idaho; general contract to D. J. Cavanaugh, Twin Falls, Idaho.

Pig Iron

Pig Iron Prices, Page 72

Pittsburgh—Makers of steel mill rolls and heavy rolling mill castings are the most active users of pig iron at present, and most makers state that business is the best in six to seven years. Mackintosh-Hemphill Co., Pittsburgh, has commenced operations in a large air furnace in its roll shop, for the first time since 1930. Struthers Iron & Steel Co., Struthers, O., expects to resume blast in its merchant furnace in September. Prices are firm.

Cleveland—Shipments have kept the steady pace set during July, but are expected to show a slight falling off during the latter part of the month. New business for the first three weeks in August has been well above that anticipated. The recent phenomenal rise in scrap prices has done much to bring this about, es-

pecially in malleable and gray iron foundries. While auto and farm equipment foundries have shown less activity, this has been more than compensated for by strong demand from machine tool, railroad castings, and heating household appliance foundries. No change in price is expected in the near future.

Chicago—Heavy specifying against old contracts continues and considerable new small-lot business is developing. With scrap rising sharply, pig iron sellers expect that the steelmakers will turn more to the use of pig iron. Prices are firm. Improvement in shipments is indicated for September.

Boston — Fairly good buying of pig iron is being done, mostly in small lots for quick shipment, but including several round tonnages. Foreign foundry iron continues to be offered at $2 under domestic price.

New York—Demand for pig iron is fair. Current buying calls for numerous carloads, mostly for spot shipment. Some inquiry has come out for fourth quarter, notably one involving 1500 tons of foundry iron. Considerable foreign inquiry features the market, this coming particularly from the Far East.

Philadelphia—A slight increase in sales of pig iron was noted last week, although no individual orders of any great size were reported. This betterment, however, was heartening to dealers. Foundry melt is somewhat lower. No fourth quarter prices have yet been announced.

Cincinnati—New orders for pig iron follow routine and are for early delivery. The melt remains high and broad, so that shipments continue close to previous levels. Stove and machine tool work remains active. A new blast furnace of the Hamilton Coke & Iron Co., production to be partly on merchant iron, is nearing completion and will be lighted soon after the scheduled date, Sept. 1.

St. Louis — With new purchasing of pig iron limited to a few scattering small lots for prompt delivery, sellers are engaged chiefly in getting forward shipments, the total of which so far this month is greater than for the like period in July, and measurably above that of a year ago. While no announcement has been made relative to last quarter prices, there is a growing opinion that an advance will be put into effect, based on the continued heavy demand for both foundry and basic iron, also on the rapidly narrowing differential between scrap and pig iron prices.

Birmingham, Ala.—Small lot purchasing of pig iron continues. Consumers are holding down inventories and the method of buying for immediate needs will be noted through remainder of year. Ten blast furnaces are in operation, with foundry iron predominating in the output.

Southern stove foundries are operating at capacity and the heavy melt is calling for additional supplies of pig iron.

Toronto, Ont. — While no large sales were made in the merchant pig iron markets for the week, local blast furnace representatives state that business is steady and shipments average around 700 tons per week. Demand, however, is for spot delivery and orders range from 50 to 200 tons. Production of iron is holding with four stacks blowing.

Ferroalloys

Ferroalloy Prices, Page 72

New York — Ferroalloy consumption is heavy and shows no tendency to lessen. Prices are unchanged and no indication is given of fourth quarter quotations.

The various offers of foreign ferromanganese at marked concessions from the $75 price are not disturbing because little tonnage is involved and in some cases material has been rejected because of its being classified as off-grade.

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DEEP DRAWN SHELLS AND SHAPES

Scrap

Scrap Prices, Page 73

Pittsburgh—Further buying last week at $16.50 per ton delivered, caused the No. 1 melting steel market to advance 50 cents a ton but remelting scrap, now at the highest price in Pittsburgh since the fourth week of March, 1930, is beginning to show some tendency to level off. In spite of the fact that brokers have been covering shortages at $16 and even 16.50, there is some trade sentiment to the effect that further startling advances are not logical to expect. The price of scrap is now diverting the attention of some melters to consideration of more pig iron in their melt. Higher prices on No. 2 steel, railroad specialties, and low phos scrap have all occurred the past week.

Cleveland—Further rise of 50 cents a ton in heavy melting steel has had the effect of uncovering some additional scrap and relieving the recent tight situation somewhat. No. 1 now is quoted $14.50 to $15. Blast furnace scrap is up similarly to $9.50 to $10 and continues in active demand. The market remains strong.

Chicago — Scrap is decidedly stronger. Prices have been advanced 25 to 75 cents on active bidding by brokers and dealers, and an increasing shortage of supplies. Continued high steelmaking operations are rapidly cutting down available scrap territory in an effort to bring in material. In some quarters $18 heavy melting is predicted this fall. At the moment, however the top of the market appears to be $16.

Boston—Difficulty in obtaining scrap for shipment against orders has caused brokers here to make some further advances.

They have raised by 75 cents their buying prices on stove plate and No. 1 and No. 2 machinery cast, 50 cents on forge flashings, mixed shafting, skeleton, machine shop turnings and iron car wheels.

New York—Brokers' buying prices continue to move up rapidly. Brokers are having considerable difficulty in obtaining material for shipment against orders and occasionally are taking a loss in covering purchases. As an example, one broker this week paid $1 higher than his selling price for stove plate for shipment to eastern Pennsylvania for delivery at $11.50.

Philadelphia—The scrap market continued its feverish activity with prices advancing this week to a point where No. 1 heavy melting steel is selling at $14.50, a figure 50 cents above a week ago. With the upward trend of steel mill production, and the difficulty some dealers have been experiencing in obtaining scrap, buyers are much more eager. No. 2 heavy melting steel scrap likewise advanced in keeping with the No. 1, reaching $13.50, as compared to $13.00 the previous week. Mixed yard cast was $14.00 compared to $13.50 previously. Railroad grate bars were at $12.00, couplers and knuckles at $18.00 to $18.50, stove plate at $12.00 to $12.50, cast wheels at $16.00 to $17.00, and rolled steel wheels at $18.00 to $18.50. These all indicate the speed which the market is making in moving upward.

Detroit—Absence of usual automotive scrap lists so far this month is being keenly felt in this district, with the result that prices show every indication of a further advance. The market remains at $12.50 to $13, f.o.b. local consuming point, for both No. 1 steel and hydraulic compressed sheet scrap. Machine turnings are quoted $7.50 to $8 and blast furnace scrap, $8 to $8.50.

Cincinnati—Need of dealers for material, which appears scarce, has sent buying prices of iron and steel scrap upward, most grades 50 cents

Behind the Scenes with STEEL

Tramps and Oysters

OUR old friend and contemporary *The Reading Puddle Ball* reports with pride that the town of Bingham, Maine, has solved the tramp problem with a so-called "tramp chair" of puddled wrought iron straps, completely encased and on wheels. It looks like a medieval torture chamber, but beyond being a little uncomfortable is perfectly harmless.

When the first recalcitrant tramp was incarcerated in the midget Black Maria and wheeled to the edge of town before being released, he lost no time in spreading the bad news and his fellow 'bos now detour around Bingham to avoid "getting the chair."

What's more, believe it or Ripley, when a puddled wrought iron hoop 2½ feet in diameter was snagged the other day by tongers working the eastern shore of Chesapeake bay, what did they find but 10,000 oysters banded together on the hoop to form a neat wreath—and probably all singing *Asleep in the Deep.*

* * *

Carrying the Torch

DESPITE the fact that the Olympic Games in Berlin have slipped from the public eye, we feel it our duty to inform you about the great torch relay which started in Olympia, Greece, July 20 and ended in Berlin on Aug. 1 in the huge sports stadium where the sacred flame for the XI Olympiad was kindled.

Some 3000 runners, recruited from the seven nations through which the blazing torch was carried, took part; after the jaunt was over, each received a 1-pound torch holder as a souvenir. The holders were of stainless steel, the handles engraved with the Reich eagle, the five Olympic rings and the route of the Olympic flame.

Thus, says the Electro Metallurgical Co., New York, an ancient ceremony has been brought up to date and perpetuated through the use of the modern metal, stainless steel.

Not having been fortunate enough to be in attendance at the Olympic Games, we at least got into the spirit of the event and strolled down to the Great Lakes Exposition to inspect a concession called Olympia. But that turned out to be something altogether different. No stainless steel torch holders there.

* * *

Farewell to Legs

OUR veddy nice "leg art" appearing here in the June 29 issue caught the fancy of many, one gentleman in particular being the chief chemist of a large eastern company who has made a specialty of amateur photography for some 18 years. He wrote in to say he was badly in need of the young lady for his collection, so with a fond, farewell pat on her—well, let's say, golden tresses, we sent her on to him. The old office hasn't been the same since she left.

Bring on more leg art, we seem to hear the customers crying.

* * *

Did You See Them?

IF YOU are at all concerned with galvanizing practice, we suggest you read carefully the articles by A. T. Baldwin, appearing in last week's issue, page 49, and in this week's, page 48. Already requests are coming in for extra copies.

* * *

Call of the Wild

THIS appears to be the summer of universal vacations. Try to get in touch with anyone, near or far, and nine times out of eight the answer will be, "Sorry, but he's on his vacation; is there anything I can do?"

Logical answer to the last question might be, "Yes, or you wouldn't have a job." But here we sit in the hot August breezes, while the rockbound coast of Maine stares into the sea, quiet and alone.

—SHRDLU

INQUISITIVE CAMERA DEPT.—XIV

A. J. HAIN, recently named managing editor of STEEL *and active with the magazine since June 5, 1918, prior to which he was a gentleman of the press in Cleveland, Detroit, and Chicago. If you have questions on news or market developments, ask A. J.*

a ton. While a week ago heavy melting steel was bringing a top of $12, it is now quotable at $12.50 to $13. Some mill buying has been done, but not on extended coverage. Continued high steelmaking levels throughout the district lend strength to sentiment.

St. Louis—With heaviest volume of buying in recent months, competition for material among brokers and dealers, a general scarcity and interference with the movement by hot weather, iron and steel scrap prices have advanced further. Two east side mill interests purchased 10,000 tons each of heavy melting steel and steel specialties for delivery over the next 60 days, paying, it is understood, $1.50 per ton above the last preceding similar material acquired. The tonnage was split among several dealers. Other melters have also been in the market.

Toronto, Ont. — Trading in iron and steel scrap is beginning to show improvement with sales for the past week well ahead of those for several months. Consumers, however, are interested only in spot needs, although mills and a few large users are covered by long term contracts. Steel shipments are fairly heavy against contract and dealers report good movement in heavy melting steel to Hamilton mills, while Montreal dealers are making good deliveries of heavy melting and other steel grades with good call for rails and steel axles. Prices are unchanged.

Warehouse

Warehouse Prices, Page 74

Cleveland — Demand for warehouse products the first three weeks of August, has shown favorably with that of July. Most of the tonnage is serving industrial requirements; little building demand has been noticed. Stock turnover on many individual items has been encouraging. The delayed delivery condition in most mills has much to do with this unseasonal demand.

Chicago—While demand is seasonally off, the letdown is not as acute as in other recent years. Considerable buying is being done for repair work which calls for prompt deliveries. Warehouses are in much better position to provide this service, as mills, because of their heavily booked conditions, have been compelled to defer shipments several weeks. Prices are steady.

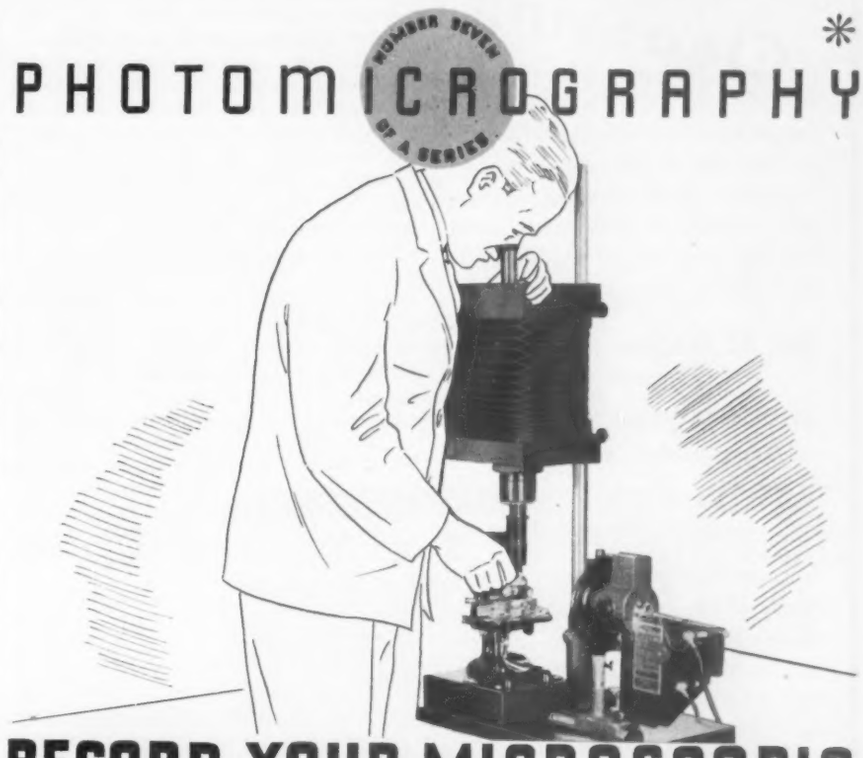
Philadelphia—Warehouse business is still in a state of activity, distinctly contrary to the seasonal trend. While no price change in any of the products was in evidence last week, the general delivery situation at the mills has once more made the economic value of the warehouse appreciated by consumers.

New York—Warehouse business in iron and steel products continues in undiminished volume. Daily average bookings for August so far have been equal to those in July, and in some directions appear to reflect an increase.

Cincinnati — A trace of midsummer tapering appears from time to time in the warehouse trade, but subsequent upturns develop to give promise of a tonnage in August near that of June and July. Activity is broad, with a sustained demand for small tonnages of building material.

St. Louis—Movement of warehouse commodities declined the past ten days, owing to extremely hot weather. However, volume thus far in August compares favorably with the like intervals in June and July. Building materials continue brisk and demand from the general manufacturing trade is being maintained at a high level. Prices are steady.

Seattle—Warehouse volume is less than last month, the decrease being



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attributed to seasonal conditions. However, improvement is expected in September. Sheets are in best demand, while light plates are also active. Prices are firm, and while Portland is under Seattle on some items, the lower levels are being confined generally to Oregon territory. Mill buying is small.

Iron Ore

Iron Ore Prices, Page 73

New York—Prices on foreign iron, manganese, chrome, manganese and manganiferous ores have been advanced and some good contracting is reported at the higher figures. Quotations on Spanish and North African ores are up ½ cent a unit. Spanish and North African basic are of the 50 to 60 per cent grade now is quoted at 11 cents per unit, alongside docks at Atlantic ports. North African low phosphorus ore is quoted at the same figure. No ore whatever now is being shipped from Spain or from Spanish ports in North Africa, due to the revolution in that country, so that the prices quoted are entirely nominal as far as any Spanish ores are concerned. Shipments continue to be made out of French Algeria, however. Foreign manganiferous ore, containing 45 to 55 per cent iron and 6 to 10 per cent manganese has been boosted 50 cents to 11 cents a unit, alongside docks at Atlantic ports.

Swedish iron ore prices are unchanged at 10.50 cents per unit on low phosphorus ore and 9.50 cents on the 65 per cent basic grade, these prices being alongside docks at Atlantic ports. The situation in connection with Swedish ores is being watched with interest, however, owing to the fact that cablegrams received here last week indicated that ore shipments from Narvik might be affected by a threatened strike.

Chrome ore has moved up impressively and some domestic consumers have placed contracts involving requirements through first quarter of 1937. Indian 48 to 50 per cent chrome ore now is quoted at $18.50 to $19.50 per gross ton, c.i.f. India 44 to 47 per cent is quoted at $16.50 to $17.50, c.i.f. Transvaal 45 per cent chrome ore is quoted at $16 to $16.50. Turkish 52 per cent concentrated chrome ore is $22 to $22.25 a gross ton, with 48 to 49 per cent concentrate at $19.50 to $19.75, 48 to 49 per cent lump ore at $19.50 to $19.75 and 45 per cent lump ore at $17 to $17.50. These prices in general represent advances of about 50 cents a gross ton.

On new contracting, South African manganese ore of the 50 to 52 per cent grade is up about 1 cent to 27 cents a unit, without duty, at Atlantic ports.

Cleveland—Receipts of iron ore at lower lake ports for this season to Aug. 1, shipments to interior furnaces, and dock balances follow:

Port	Receipts	Shipments	Dock Bal. Aug. 1,'36
Buffalo	1,347,597	2,084	2,030
Erie	708,281	715,405	45,849
Conneaut..	2,522,128	2,775,362	1,339,863
Ashtabula	1,663,750	1,823,400	1,509,545
Fairport ...	374,454	376,990	387,085
Cleveland..	3,636,829	3,106,502	382,807
Lorain	1,107,139	658,037	12,527
Huron	349,170	368,551	314,589
Toledo	697,222	334,849	18,322
Total.....	12,406,570	10,161,180	4,016,613
Year ago...	8,524,165	6,670,614	4,282,019

The number of boats in commission on the Great Lakes Aug. 15, was 245 out of a total of 318. Of these 245 boats, 228 were used in the ore trade. At the same time last year 153 boats were in the ore trade out of 174 in commission, while the total number of boats was 324.

Steel in Europe

Foreign Steel Prices, Page 74

London — (*By Cable*) — Foreign trade in steel and iron by Great Britain in July showed a marked increase over June. At 216,129 gross tons steel exports were 42,593 tons larger than in June. This is the largest export tonnage since October, 1935, when 224,000 tons were exported. Imports were 170,309 tons in July, 59,690 tons greater than in June and the largest since February, 1932, when 252,300 tons were imported.

Markets in Great Britain are unusually active for the summer vacation season. Bookings of new business are less but deliveries are heavy on business already contracted. Inquiry for export is increasing steadily. Foundries are busy and are obtaining better shipments of pig iron.

Steelworks are at capacity. Black sheets are meeting fair demand for domestic and export shipment, galvanized sheets are dull and tin plate is steady.

The Continent reports export trade is active and Belgium and Germany find domestic demand also satisfactory.

Bolts, Nuts and Rivets

Bolt, Nut, Rivet Prices, Page 71

Widespread price weakness in bolts and nuts has been increasingly evident. Against an official quotation on small carriage and machine bolts of 70 and 10 off list, two and even three extra 10's off list are being

quoted on some business. Weakness apparently has not affected large structural rivets which hold firmly at 3.05c, Pittsburgh or Cleveland, 3.15c, Chicago, or small rivets at 70 and 5 off list. The market on wrought washers is firm at 6.25 off list as quoted to jobbers and large users.

Procurement division, treasury department, New York, is buying on an average of a carload or so of bolts and nuts a week, on lump sum bids on mixed carloads. In some cases bids are taken on a combination of nails, bolts and nuts or a car of steel angles, nails, bolts and nuts. This method of taking lump sum bids on mixed carloads is not proving conducive, it is said, to firm maintenance of the current discounts.

Metallurgical Coke

Coke Prices, Page 71

Two blast furnace interests came into the beehive coke market last week with inquiries based upon their plans to resume production in September. Wickwire Spencer Steel Co., New York, plans to blow in one of its Harriett furnaces at Tonawanda, N. Y., sometime next month and has issued an inquiry for 20,000 tons of beehive coke monthly. Struthers Iron & Steel Co., Struthers, O., expects to blow in at the same time and has inquiries out for 15,000 tons of coke monthly. Beehive coke producers are now firmly quoting the market on standard furnace coke at $3.65 minimum, and in some cases have revised contracts upward. Several makers of common foundry coke have advanced the market 25 cents a ton in the past week to $4.25 f.o.b. ovens minimum.

Nonferrous Metals

Nonferrous Metal Prices, Page 72

New York—Strength in prices and well sustained consuming activity at rates well above normal characterized the situation in the nonferrous metals last week. The trade generally is looking for higher levels on most metals before the year is out.

Copper—The market appeared primed for a price rise as the week opened. Two schools of thought, however, have split the ranks of copper sellers. One favors retention of the present 9¾-cent level along with increased production, while the second would move the price up to 10.00c immediately. The first group is determined there will be no reoccurrence of the runaway market of a few years but apparently will not block a ¼-cent rise some time later this year. Copper-bearing scrap continues strong despite the failure of the market for virgin metal to advance.

Lead—July statistics issued last week revealed the second largest shipments for any month this year and an increase of only 600 tons in total stocks. Supplies of metal above ground, however, are excessive and will prevent more than a moderate price advance over the near future. Stocks are expected to drop both in August and September. Consumers are well covered for August and September and now await opening of October books.

Zinc—Low foreign prices and consequent threat of imports continue to hold down the market here. Talk abroad seems to favor renewal of the European zinc cartel which would mean higher prices and likewise permit higher levels here. High-grade sellers look forward to increased automotive demand next month. The 1937 models are expected to take as much tonnage as those for 1936 although zinc alloy radiator grilles may not be so much in evidence.

Tin—It is expected that the future of the tin control scheme will be disclosed following the meeting of the International Tin committee Sept. 18. In the meantime, prices are tending toward the weak side. Consuming industries are at close to peak rates.

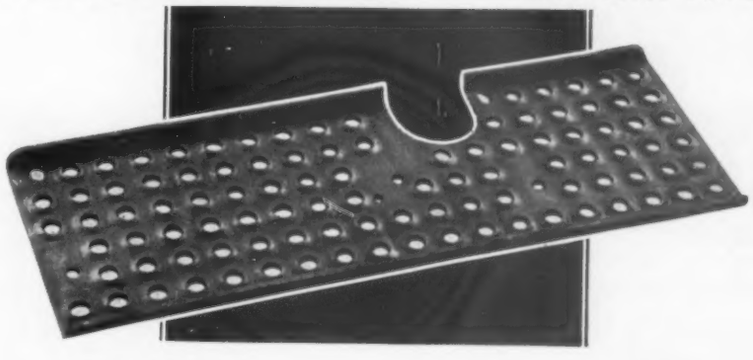
Antimony—American prices have fluctuated with the week recording a slight net gain. Demand was only for small lots.

Equipment

New York—While vacations as usual are interfering with the placing of new business for the moment, some equipment manufacturers report their August bookings heavier than those in July. Many new inquiries continue to be received by sellers of machine tools and other equipment. The matter of deliveries continually is becoming a more difficult problem as on some machines shipment cannot now be had until well after the turn of the year.

Demand from England is increasing, but American makers in many cases are refusing to sell to any large extent abroad in view of the effect such sales would have on their position with domestic customers. For instance, one English inquiry for 40 large machines of one type failed to bring out a quotation; the inquiry resulted from the fact that English makers of such machines are sold for about two years ahead. Some quiet inquiry for machine tools is coming from Italy.

RAILROAD SAFETY via STAMPINGS



RAILROADS, as with industry in general, are looking-up to the steel stamping as a combined economic and effective method of application to their equipment or product. This freight car step—a stamping by Parish—additionally serves a major safety factor by imparting a sharp, self-cleaning tread impervious to ice, snow, grease and wet shoe soles.

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Construction and Enterprise

Ohio

CARROLLTON, O. — Village board of public affairs, Sam Poole secretary, has engaged Arnold-Rosch & Hartline, New Philadelphia, O., as consulting engineer for a proposed sewage disposal plant and sewerage system.

CINCINNATI — Lackner Co., manufacturer of signs, York and Western avenues, plans to construct a 2½-story, 100 x 150 feet, building with steel sash. J. R. Biedinger, Trac building, is structural engineer.

COLUMBUS, O. — City, L. Lewis service director, asks bids for $33,000 worth of pumps and piping on contract No. 5, and for other equipment, for sewage treatment works being constructed with PWA aid.

DAYTON, O. — Pantorium Inc., 2943 Salem avenue, has engaged Ralph W. Carnahan, Mutual Home building, architect, to prepare plans for a 1-story boiler house and mechanical drying equipment. Total cost is estimated at $30,000. (Noted STEEL July 13).

GEORGETOWN, O. — Village board of public affairs, E. H. Stout president, plans to purchase low lift pumping equipment for installation in a proposed waterworks improvement to be financed by PWA funds. Bids received July 24 were rejected. Burgess & Niple, 568 East Broad street, Columbus, O., is consulting engineer. (Noted STEEL June 8).

JEFFERSONVILLE, O. — Village is considering making WPA application and call a vote on a bond issue for funds to construct a $61,000 waterworks. Marcus Shoup, Schmidt building, Xenia, O., is consulting engineer.

LIBERTY CENTER, O. — Village board of public affairs has plans for construction of a complete waterworks and distribution system to cost approximately $53,000. Bond issue of $15,000 to be submitted Sept. 1. Champe, Finkbeiner and associates, 1025 Nicholas building, Toledo., O., is consulting.

MARTINS FERRY, O. — Cupal Casting Co. has been organized and will manufacture bronze castings and other items in the former Rail and River power house on South Belmont street. Joseph S. Anderson is prominent in the firm.

MARYSVILLE, O. — Union Rural Electric Co-Operative Inc. plans to erect 280 miles of lines to serve 1200 homes. Cost is estimated at $336,000. W. O. Ziegler is president. Carl Frye, of the Ohio Farm Bureau Electrical Co-Operative Inc., 620 East Broad street, Columbus, O., is consulting engineer.

PANDORA, O. — Village plans to ask PWA for $30,000 to help finance construction of a $50,000 waterworks. J. Kempf is mayor.

QUAKER CITY, O. — Village has plans that probably will mature soon for a $35,000 sewage plant and system. Bond issue of $10,000 passed. E. I. Van Scio is mayor. WPA approval granted.

RAWSON, O. — Village, Jacob C. Romick mayor, contemplates construction of a $49,000 waterworks with the aid of PWA. R. J. Mason, Findlay, O., is handling the plans.

RUSHSYLVANIA, O. — Village has plans for construction of a $65,000 waterworks. Carl Simon, Van Wert, O., is consulting engineer for this proposed WPA project.

SPRINGFIELD, O. — Buckeye Bumpers Inc., subsidiary of Electric Auto-Lite Co., Toledo, O., plans to double capacity with an expenditure of $100,000. B. F. Fortier is vice president and general manager of the company that manufactures bumpers, hub caps, and spring covers.

SYLVANIA, O. — Village, Eugene Saunders councilman, has report of Champe, Finkbeiner and associates, 1025 Nicholas building, Toledo, O., on a proposed power plant and distribution system. May be either WPA or PWA project. (Noted STEEL May 25).

UPPER SANDUSKY, O. — City board of public affairs, R. M. Rossel president, will have plans ready about Sept. 1 for a water distribution system. H. P. Jones & Co., Second National Bank building, Toledo, O., is consulting engineer.

WAUSEON, O. — Amos Baldwin Wyoming Co., manufacturer of shovels, plant here was damaged by fire Aug. 15.

WELLSVILLE, O.—City, Fred Gluth service director, has PWA approval and will complete plans by Oct. 1 for waterworks improvements. Bids may be asked Sept. 1 for pumping equipment and meters. Morris-Knowles Co., Westinghouse building, Pittsburgh, is consulting engineer. Cost is estimated at $192,727. (Noted STEEL Aug. 10.)

WEST UNITY, O. — Village, W. E. Caughey mayor, will pass on a $28,000 bond issue at a special election for the proposed waterworks system. Champe, Finkbeiner, and associates, 1025 Nicholas building, Toledo, O., is consulting engineer for this proposed PWA project. (Noted STEEL Aug. 17).

WOOSTER, O. — City, William Long mayor, considers construction of a storage tank and sewage treatment plant at Killbuck valley pumping station. H. P. Jones & Co., Second National Bank building, Toledo, O., consulting engineer, has submitted report to council.

Michigan

ALMONT, MICH. — Hurd Lock & Mfg. Co., E. P. Hurd, president, Detroit, has purchased a plant at Adrian containing 100,000 square feet of floor space. Locks, hub caps, molding manufacture will be carried on in the plant.

BATTLE CREEK, MICH. — Post Products division, General Foods Corp., has broken ground for two buildings to house various departments, including the machine shop. H. K. Ferguson Co., Hanna building, Cleveland, is general contractor.

CHESANING, MICH. — Farmers Elevator Co. plans rebuilding flour and grain elevator at a cost of $50,000, including purchase of equipment. D. E. Terry is head of the company.

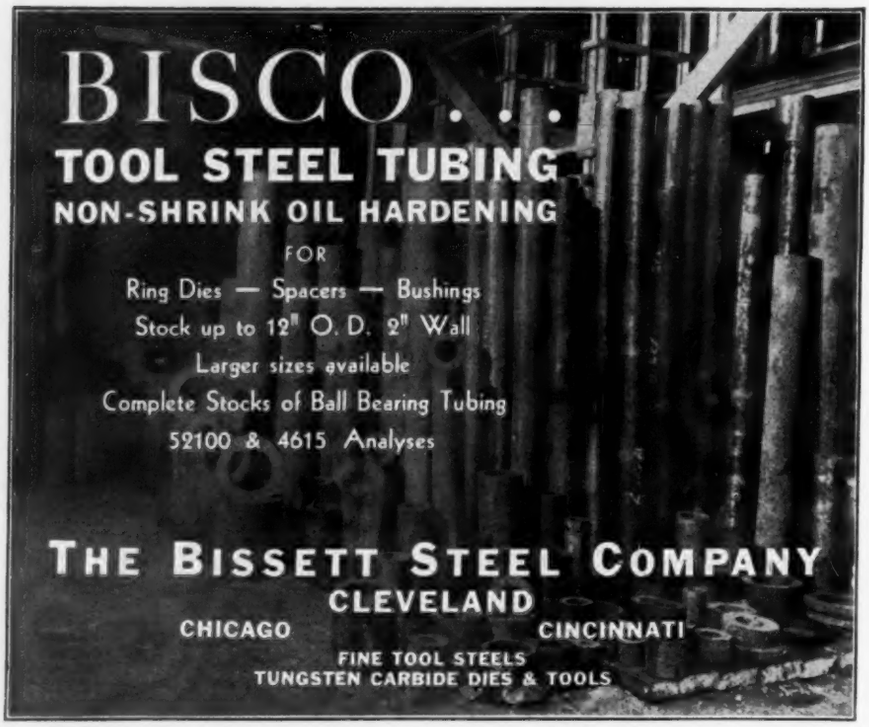
DETROIT — Flexible Coupling Corp. has been incorporated by Trevor G. Murton, 631 Selden avenue, to engage in manufacturing.

DETROIT—Electro Mechanical Products Co. has been incorporated to manufacture electrical devices. C. J. Pilliod Jr., 6209 Hamilton avenue, is interested.

DETROIT — Clayton Electric Co. Inc. has been incorporated to do a general manufacturing business. R. S. Clayton, 233½ South Main street, Wichita, Kans., is interested.

FLINT, MICH.—City, James R. Pollock,, director of public works and utilities, will purchase equipment and construct a waterworks on plans calling for bids about Sept. 20. O. K. Phillips is city engineer, and Shoecraft, Drury & McNamee, American Savings Bank building, Ann Arbor, Mich., is consulting engineer for this propsed $500,000 project.

MENOMINEE, MICH. — Signal Electric Mfg. Co., maker of electric fans and appliances, will take bids soon on



plans by Derrick Hubert, architect, here, for a wing addition to the factory, 56 x 79 feet, costing about $30,000. O. A. Hanes is general manager.

PLYMOUTH, MICH. — Burroughs Adding Machine Co., 6071 Second, Detroit, contemplates construction of a factory on a 140 acre site here purchased several years ago. Standish Backus is president.

WHITE CLOUD, MICH.—City may purchase a diesel generating unit in extensions authorized in the municipal electric plant.

Illinois

CLINTON, ILL. — City has plans under consideration for improvements in the water supply system. Warren & VanPraag, Decatur, Ill., is engineer for this proposed PWA project.

HILLSIDE, ILL. — City has plans under consideration for improvements in the water supply system. Municipal Engineering & Equipment Co., 212 South Marion street, Oak Park, Ill., is consulting.

WAUKEGAN, ILL.—Timken-Detroit Axle Co., 100 Clark, Detroit, plans to establish a plant here for the production of tractor axles. Approximately $100,000 is to be spent. Willard F. Rockwell is president.

Indiana

FAIRMONT, IND. — Town is taking bids for a 100,000 gallon elevated steel tank and standpipe and other equipment to cost $30,000.

FREEMONT, IND. — Town board has plans for spending $54,545 for pumping equipment, a 600,000 gallon elevated steel tank, and a distribution system. V. Hurd, 1039 Architects & Builders building, Indianapolis, is engineer.

INDIANAPOLIS — Universal Corp., 254 North Capitol avenue, has been incorporated to manufacture rotary motors, engines, and motor vehicles. Charles M. Tumey is resident agent, and Harry L. Cushwa, Edward H. Long, John P. Skinner, August C. Enderlin, James E. Frazier, Charles W. Sopher, John L. Tibbs, and Carl Bratton are incorporators.

KOKOMO, IND. — Gowdy Bros. Boiler Co., William Gowdy, owner, was damaged by fire recently.

RICHMOND, IND. — Wayne County Rural Electric Membership Corp. has been organized. T. W. Druley, Peter Flatley, Park Ammerman and others are the incorporators.

Pennsylvania

FACTORYVILLE, PA.—Factoryville school district is considering purchase of a pumping unit with 700 gallons per minute capacity, and a 1000-gallon steel storage tank. Total cost is more than $1000. J. G. Miller is secretary.

LOGANVILLE, PA.—Borough has received approval from PWA for construction of a water distribution system; will take bids soon. Total cost is to be $58,000.

McKEESPORT, PA.—Carnegie-Illinois Steel Corp., Pittsburgh, suffered fire damage to the chrome finishing department of the Wood works here.

PHILADELPHIA — Contracting officer, Frankford arsenal, Administration building, Bridge street, asks bids until Aug. 26 for furnishing 26 oil twist drills, proposal 35.

SALISBURY, PA.—Somerset county is seeking a loan and grant from PWA to help finance construction of a waterworks system expected to cost $80,000. P. Hinkle, Parsons, W. Va., is engineer.

Connecticut

HARTFORD, CONN. — State department of education has been authorized to spend $180,000 to buy machinery for state trade schools.

Massachusetts

BOSTON—New England Power association has plans for erection of 18 miles of transmission lines and other facilities from Tewksbury to Melrose. Cost is estimated at $1,250,000.

ROCKLAND, MASS. — Town has received PWA approval for erection of a $46,350 standpipe. J. Dudley, Town hall, is superintendent of the water department.

WEST NEWBURY, MASS. — Town will call for bids soon for construction and equipping a proposed $35,000 pumping station. Whitman & Howard, 89 Broad street, Boston, is engineer.

New York

BROOKLYN, N. Y.—Reliance Bronze & Steel Co. Inc., 65-105 Dobbin street, has been formed to acquire assets of Reliance Bronze & Steel Corp. E. F. Gillespie is president of the new concern, and Charles A. Andres is vice president and general manager.

BUFFALO — Republic Metalware Co. Inc. buildings have been leased and are being rehabilitated for manufacturing purposes. The Republic company has transferred part of its manufacturing here. The remainder of the space is being leased.

NEW YORK—Leicester Contracting Co., South Teruggi, 875 Sixth avenue, is in the market for a belted-type air compressor with capacity of 1200 feet.

NEW YORK—R. C. Stanhope Inc., 101 West Thirty-first street, is in the market for a 25-ton Link-Belt locomotive crane with a 50-foot boom, and bucket handling bridge cranes with alternating current motors.

NIAGARA FALLS, N. Y.—Union Carbide Co., unit of Union Carbide & Carbon Corp., Carbide anid Carbon building, New York, is taking bids shortly for two large buildings to house additional furnace capacity here.

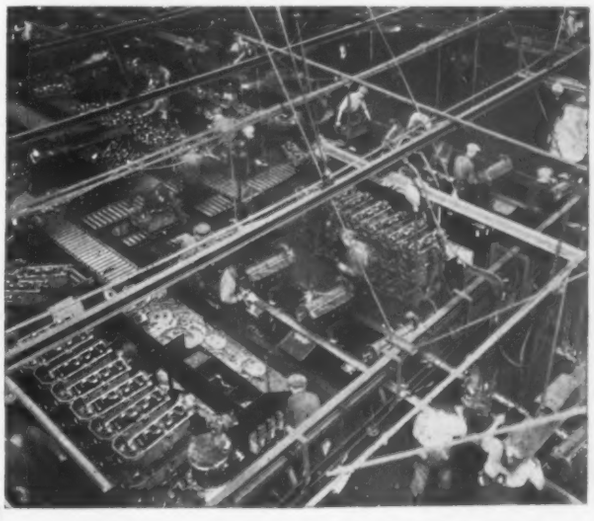
LONG ISLAND CITY, N. Y. — Industrial Supply Co., recently organized, has established a mill and factory business at 25-19 Forty-third avenue.

LONG ISLAND CITY, N. Y. — Brinberg Body Builders Inc., 37-42 Twenty-second street, has been organized by J. Brinberg to manufacture truck bodies.

LONG ISLAND CITY, N. Y.—A. Waterman Mfg. Co., recently organized, has established a plant at 1205 Forty-third avenue, for pressure molding of plumbers' goods.

LONG ISLAND CITY, N. Y. — Progressive Aluminum Co., maker of aluminum slush castings, recently moved

(*Please turn to Page* 93)



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COLUMBUS, OHIO

(Continued from Page 91)

its plant from Brooklyn to 1305 Forty-fourth avenue.

LONG ISLAND CITY, N. Y. — Simmons Bros., 5 Court square, maker of a photograph enlarger constructed principally from steel drill rods and aluminum castings, plans to move into larger quarters soon.

LONG ISLAND CITY, N. Y. — Micro Machine & Tool Co., recently organized by George and Fred Wolfmayer, has established a plant at 47-33 Fifth street. The company makes tools and dies, and specializes in special machinery development.

Alabama

BIRMINGHAM, ALA.—R. E. Bodd, 1427 South street, is in the market for automatic draw-off conveyors for lime kilns.

BIRMINGHAM, ALA.—Birmingham Ornamental Iron Co. has begun erection of a new plant and office at Forty-fourth street and Morris avenue. Bert M. Meadow is president.

BIRMINGHAM, ALA.—W. M. Smith & Co., dealer, Forty-fifth to Forty-eighth streets, First avenue, North, is in the market for a mushroom lifting magnet for handling scrap and a 250-horsepower corliss engine.

CULLMAN, ALA.—Cullman Electric Membership Corp. has received an allocation of $27,000 from the REA for construction of 26 miles of rural lines.

FAIRFIELD, ALA.—City will vote Sept. 21 on erecting a municipal distribution system using TVA power.

GADSDEN, ALA.—City has received an allotment of $10,000 from WPA for a waterworks intake project.

PHOENIX CITY, ALA.—City proposes to apply to WPA for funds with which to construct extensions to the waterworks and purchase fire hydrants.

Maryland

HAGERSTOWN, MD.—City has been asked by local business men to construct a steel hanger at the local airport and make other improvements.

LEONARDSTOWN, MD. — Rural Electrification administration, Washington, has allocated $35,000 to electric co-operative now being formed to erect rural lines in St. Mary's county. Rev. S. J. Rudtke is interested.

District of Columbia

WASHINGTON — Treasury department, procurement division, federal warehouse, H. E. Collins, assistant director, asks bids until Aug. 27 for furnishing 293 kegs of miscellaneous sizes of common and casing wire nails delivered free on board at Tucker, Ala.; until Aug. 25 for furnishing an 8-ton road roller, 3-wheel type, gasoline engine driven, for R. D. McGill, WPA warehouse, Youngstown, O.; and until Aug. 28 for furnishing miscellaneous sizes of pipe and fittings delivered at various points; and for 15 power rollers, weighing not less than 10 tons, to be delivered to P. W. Donohue, Old Postoffice building, Pittsburgh.

WASHINGTON — Navy department, bureau of supplies and accounts, asks bids until Aug. 25 for furnishing steel forgings for kingposts and tubes delivered at Philadelphia, schedule 8573; miscellaneous starters and motors delivered at Philadelphia, schedule 8583; miscellaneous electric drills delivered various points, schedule 8584; miscellaneous motor driven flushing pumps, schedule 8586; miscellaneous castings for casings and steam chests for turbines delivered at Brooklyn, N. Y., schedule 8587; miscellaneous steel forgings delivered at Philadelphia, schedule 8592; miscellaneous gasoline engine driven electric generating sets delivered various points, schedule 8601; one motor driven, tool room precision lathe delivered at Portsmouth, Va., schedule 8603; miscellaneous gasoline engine driven centrifugal pumps delivered various points, schedule 8609; one motor driven hacksaw machine delivered at Mare Island, Calif., schedule 8612; and one motor driven woodworker's lathe delivered at Portsmouth, Va., schedule 8619.

Kentucky

BETSY LANE, KY. — Pike-Floyd Coal Co. plans to acquire coal handling facilities at a cost of about $40,000.

ERLANGER, KY. — City, Russell Victor city attorney, considers purchase of an elevated tank, construction of a pumping station and laying mains for the waterworks. City has authorized sale of $75,000 worth of bonds, and may apply to PWA.

LEXINGTON, KY.—City plans purchase of motor driven pumping machinery and other equipment in a $3,400,000 expenditure to increase the water supply. J. S. Watkins, Citizens Bank building, is consulting engineer. Federal aid is sought.

NEWPORT, KY.—Newport Rolling Mill Co., has plans for construction of an inclined pump track and flume on the right bank of the Licking river, opposite Cincinnati.

OWENSBORO, KY.—City has employed Charles Brossman, 1009 Chamber of Commerce building, Indianapolis, as consulting engineer for a proposed installation of a turbine.

STAMPING GROUNDS, KY.—City has received approval from PWA for improvements in the waterworks to cost $27,250. H. B. Forbes, Richmond, is engineer.

VERSAILLES, KY.—City has voted to issue $25,000 worth of bonds to help finance construction of a $65,000 sewage disposal plant and to extend sewer lines. W. C. McCauley is mayor.

Florida

FT. BARRAMAS, FLA. — District quartermaster accepts bids until Sept. 8 for furnishing and installing lifting pump equipment at McHenry, Miss.

MIAMI BEACH, FLA. — City clerk asks bids until Sept. 1 for furnishing a 125 horsepower electrically operated causeway booster pump with capacity of 3500 gallons per minute.

ORLANDO, FLA. — Florida Public Service Co., 100 East Central avenue, plans to construct 50 miles of rural distribution lines, and a short transmission line to the phosphate field.

Georgia

COLQUITT, GA. — Colquitt Rural Electric Corp. has allocation of $275,000 from REA for the erection of 276 miles of lines in Colquitt, Brooks, Thomas and Worth counties.

DOUGLASVILLE, GA. — Douglas County Electrification committee plans to erect 83 miles of lines in Douglas, Carroll, Cobb and Paulding counties on a REA allotment of $83,000.

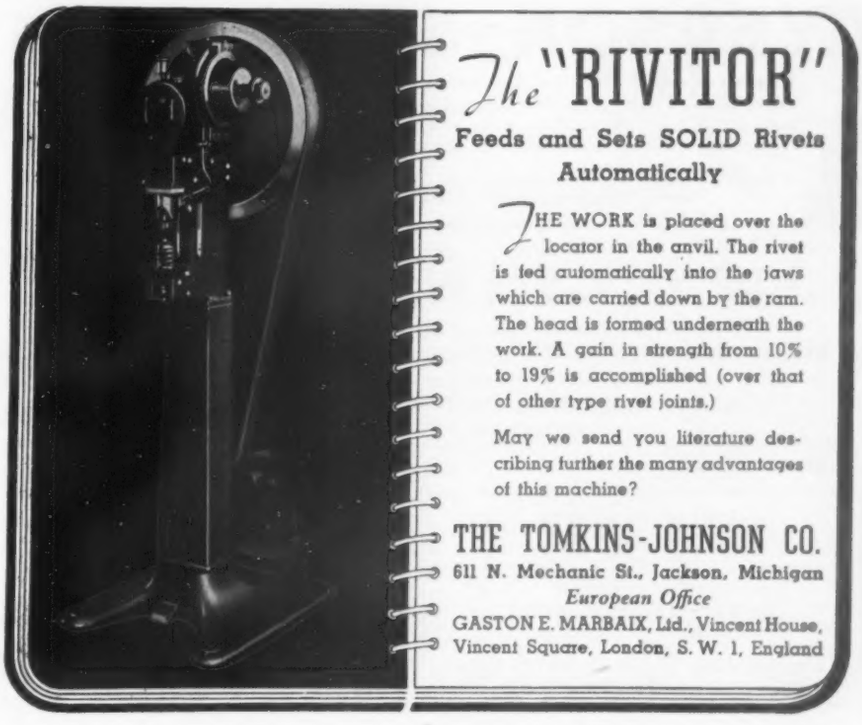
MONROE, GA.—Walter Agricultural association has received an allotment of $90,000 for construction of 80 miles of rural lines in Morgan, Walton and Barrow counties.

THOMASVILLE, GA.—City has engaged Wiedeman & Singleton, Candler building, Atlanta, Ga., as engineer for a proposed waterworks construction.

Louisiana

HARVEY, LA.—Continental Can Co. Inc., 100 East Forty-second street, asks bids until Aug. 31 for an elevator and

(Please turn to Page 95)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(Concluded from Page 93)

machinery for installation in a new warehouse to be built here.

Mississippi

BLUE MOUNTAIN, MISS.—City expects to call for bids soon for construction of a municipal waterworks estimated to cost $46,000. City seeks a PWA loan and grant.

NATCHEZ, MISS. — Fayette-Utica Rural Electrification association is scheduled to be the name of a group that plans to erect 125 miles of lines. Evon Ford is chairman of the state electrification authority, and J. O. Emmerich, McComb, Miss., is chairman of the state planning board.

PASS CHRISTIAN, MISS.—WPA area engineer, W. W. Saunders, Hattiesburg, Miss., has approved plans for construction of a waterworks system and purchase of a 500,000-gallon elevated steel tank, pumping and distribution equipment.

North Carolina

RALEIGH, N. C.—State REA director, Dudley Bagley, announces that Pitt County Electric Membership Corp. has applied for $36,000 from REA to construct 36 miles of lines in Pitt and Green counties.

WALLACE, N. C.—Z. J. Carter, dealer, is in the market for structural steel for a store building.

WANANISH, N. C.—Council Tool Co. plans to rebuild plant for the manufacture of tools for gathering turpentine.

South Carolina

CHARLESTON, S. C.—Merritt Dredging Co., L. Merritt, superintendent, 63 Rutledge avenue, is considering purchase of 2 new diesel engines for dredge, and other equipment.

Tennessee

CLARKSVILLE, TENN.—City is awaiting survey to be made by Thompson, Wood, & Hoffman, engineer, 2 Wall street, New York, on the feasibility of constructing a new power plant, and on the proposed expenditure of $250,000 for a distribution system.

West Virginia

HEMPHILL, W. VA.—Kingston Pocahontas Coal Co. has awarded a contract to Semet-Solvay Engineering Corp., 40 Rector street, New York, for design and supervision of construction of coal washing and preparation equipment for installation at its Exeter mines.

KENOVA, W. VA. — City asks bids until Sept. 1 for furnishing pumps and other equipment to dispose of sewage during floods. Total cost is $29,000.

NOLAN, W. VA.—Big Creek Winifrede Coal Co., Pittsburgh, will build an aerial tramway across the Tug Fork of the Big Sandy river, here.

Missouri

COLUMBIA, MO.—Boone County Co-Operative Electric association is considering erection of 127 miles of rural distribution lines. P. H. Henderson, Columbia, is interested in the project, and Baumes-McDevitt Co., Railway Exchange building, St. Louis, is engineer. (Noted STEEL June 15).

KANSAS CITY, MO. — Sterling Machinery Corp., 411 southwest boulevard, maker of pumps and hoists, is to occupy an additional 7000 square feet of space. C. Barzer is president.

ST. LOUIS—Mississippi Valley Equipment Co., 511 Locust street, is in the market for a complete steam turbine plant, including boilers, generators, pumps and condensers.

Oklahoma

GOLTRY, OKLA. — City voted to issue bonds for proposed construction of a new $27,000 waterworks system. G. S. Huey, Oklahoma City, Okla., is engineer.

PARKER CITY, OKLA.—City may add diesel equipment to present facilities. Burns & McDonnell, 107 West Linwood boulevard, Kansas City, Mo., is consulting engineer.

Texas

CROCKETT, TEX.—City has voted bonds to finance improvement of the waterworks and sewage systems at a cost of $25,000. J. D. Woodson is secretary for the city.

HOUSTON, TEX.—City plans to spend $109,000 for a water distribution system in various additions. Plans for spending $15,000 for a 300,000 gallon elevated steel tank are being considered.

LANCASTER, TEX.—City has approved issuance of $20,000 worth of bonds, with which to repair the waterworks.

Wisconsin

EAU CLAIRE, WIS.—City council has applied for a PWA grant with which to finance proposed waterworks improvements estimated to cost $55,000. O. E. Oien is city clerk.

MILWAUKEE — Milwaukee Electric Tool Corp., maker of portable hand drills, has moved from the old Kempsmith milling machine plant in West Milwaukee to 106 North Water street.

RACINE, WIS.—Twin Disc Clutch Co., maker of clutches, gear reducers, etc., plans to install equipment and construct a shop addition. Contract for the building, 60 x 120 feet, has been let.

SHEBOYGAN FALLS, WIS.—Kerskamp Bros. foundry, 737 Buffalo street, will be remodeled by its successor, Kerskamp & Potts Foundry Co. Edward Kerskamp is president; Francis Potts, vice president, and L. J. Steimle, secretary-treasurer.

Minnesota

HALLOCK, MINN.—Village plans to install pumps and other equipment in the water filtration plant. O. Myre is clerk.

Kansas

KANSAS CITY, KANS. — Built-Rite Trailer & Body Co., 922 Genesee, has been organized to manufacture truck and trailer bodies; a 2-story building is to be occupied. E. E. Wild is president.

ST. PAUL, KANS. — City has voted $62,000 worth of bonds to help finance construction of a 50,000 gallon steel tank and purchase of other equipment.

Nebraska

ARCADIA, NEBR. — Middle Loup Public Power & Irrigation district, which includes Custer and Sherman counties, has a federal grant of $625,909 and a loan of $765,000 to help finance construction of electric power facilities and to carry out an irrigation program.

ORD, NEBR. — North Loup River Public Power & Irrigation district has a PWA loan of $916,000 and a grant of $749,000 to help finance construction of electric power facilities to serve 40,000 acres and to carry out an irrigation program.

Idaho

COEUR d' ALENE, IDAHO—City has engaged Ernest C. Parker, Denver, as consulting engineer for a proposed power project; legality of project still is involved.

Utah

SALT LAKE CITY, UTAH—Purity Baking Co. is considering construction of a $250,000 steam plant and addition. Walter E. Ware is architect.

Pacific Coast

LOS ANGELES—Union Oil Co., 2400 West Orange, Alhambra, Calif., proposes to construct two and possibly four tankers to be powered with high pressure turbines. William L. Stewart is vice president in charge of manufacturing.

PITSBURGH, CALIF. — Columbia Steel Co. plans to spend $149,000 to extend the foundry building and equipment, and $66,000 for a new ladle crane for No. 2 open hearth. Other improvements will bring the expenditures up to $386,000.

RED BLUFF, CALIF. — City council has authorized E. E. Stevens, superintendent of city waterworks, to take bids for a deep well turbine pump and motor.

SONORA, CALIF.—Carson Hill Gold Mining Corp. will operate the ball mill at its Carson Hill mine at Melches with a 250 horsepower electric motor. Other machinery and equipment is to be purchased.

PORTLAND, OREG. — Bayer Sheet Metal Works, 14 Southwest Market street, was damaged by fire recently.

PORTLAND, OREG.—Cutler Mfg. Co., 353 East Tenth street, has purchased 1½ acres on Southwest Seventeenth avenue for building purposes.

PORTLAND, OREG.—City council has approved plans for a sewer system and disposal plant to be submitted to voters in November. Previously a $6,000,000 bond issue was voted, but plans were revised to stagger costs over a 10-year period.

SEATTLE—Jones & Orth Cutter Head Co. has been capitalized at $40,000 and incorporated by Winslow Jones and Will Orth, 1934 First avenue, South.

Canada

TORONTO, ONT.—North West Minerals Ltd., 1213 Canada Permanent building, has plans under consideration for the construction of a 10,000-horsepower hydroelectric project on the Tazis river that may cost $1,000,000.

Alaska

SEWARD, ALASKA — Town clerk calls bids for Oct. 12 for constructing a proposed $140,000 hydroelectric plant here on plans prepared by Hubbell & Walker, Seattle. A power house, 11 miles of transmission lines, and laying 5180 feet of pipelines is included in the proposed project.

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